



**PETROLEUM ECONOMIST: THE NORTH SEA
ANNUAL CONFERENCE**

TRANSCO - A VIEW FROM THE BEACH

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TRANSCO - A VIEW FROM THE BEACH

I am pleased to be invited back to speak at this conference after speaking here last year. Hopefully, I am speaking to a completely new audience so that when I repeat my favourite stories you will be hearing them for the first time.

Last year, my view from the beach concentrated on Network Code with a hint of Interconnector. Now that Network Code is in place and working well and the Interconnector is firmly on schedule, I'd like to give a 1996 view that you'll find both interesting and informative, by bringing a new angle to issues that have been extensively discussed in the past year or so.

TransCo's next price control formula is clearly a crucial issue and worthy of debate. However, I'm not part of TransCo's negotiations team and so am unable to shed much light on the latest position. Instead, I have just about worked out a way of telling a story that links the following:

- Short Term Supply/Demand Developments
- TransCo's NTS Expansion
- TransCo's Engineering for Value Initiative (Onshore version of CRINE*)
- Offshore Gas Field Performance
- Flexibility Mechanism and How to be a Shipper?
- TransCo Exit Connection Policy
- The Interconnectors
- Interruption Experience
- I&C Market Growth
- Value of Peak Gas

*CRINE = Cost Reduction in the New Era

The link between all these issues is that all have a significant effect on the peak day, whether on the supply or the demand side.

The starting point is a look at supply, demand and transportation capacity over the next three winters, 1996/7, 1997/8 and 1998/9.

Supply Side Developments in 1996 to 1998

On the supply side, we are in the lull before the storm. Not much happens in 1996 apart from J Block, will it flow or won't it? Who knows? All I would say on this is that at around 9 MCMD (300 mmscfd) this represents a significant tranche of gas, around 2% of UK peak. It will be missed (Note - my mmscfd is million standard cubic feet per day).

In 1997, Armada and Erskine come on stream at Teesside at a combined rate of around 15 MCMD (550 mmscfd). However, it is 1998 that brings a big pipeful of gas as a result mainly of Britannia at St Fergus and ETAP at Teesside, around 50 MCMD (1800 mmscfd) in total. These new supplies are summarised in the table below.

All figures from Arthur Andersens or Wood Mackenzie.

Production Start 1996/7

Field	Terminal	Capex £m	Peak mcmd	Peak mmscfd
Andrew	Teesside	330	1	36
J-Block	Teesside	840	9.5	340
Schooner	Theddlethorpe	250	4.8	170
Telford	St Fergus	90	1.3	50
Tyne/Trent	Bacton	250	7	250
Others	St Fergus	565	2	70
Total		2,325	26	920

Production Start 1997/8

Field	Terminal	Capex £m	Peak mcmd	Peak mmscfd
Armada	Teesside	580	12	430
Curlew	St Fergus	100	2.5	90
Erskine	Teesside	330	3	100
Galley	St Fergus	75	1.6	60
Viking Sat.	Theddlethorpe	70	3	100
Total		1,155	22	780

Production Start 1998/9

Field	Terminal	Capex £m	Peak mcmd	Peak mmscfd
Boulton	Theddlethorpe	70	2.7	100
Braemar	St Fergus	80	5	180
Britannia	St Fergus	1,600	20	720
Camelot SE	Bacton	40	2	70
ETAP	Teesside	1,700	13.4	480
Hunter	Theddlethorpe	20	1.2	40
Jacqui	Teesside	90	2	70
Jupiter II	Theddlethorpe	100	2.3	80
Kingfisher	St F or Peterhead	300	1.7	60
Total		4,000	50	1,800

I guess most people at this conference still quote gas flows in mmscfd and energy in therms. Me too. **Unfortunately, the days of those units have gone.** The Network Code is based on kWh...I've no idea what one of them is and long to go back to cubic feet and therms. However, I'm just about coming to terms with MCMD having developed some rules of thumb:

Britannia and ETAP = 35 MCMD
 Interconnector = 55 MCMD
 UK peak = 400 MCMD ish

The result of all this gas coming to the market (representing a net increase in peak of about 60 MCMD or 15% of demand), combined with low gas prices, is that producers are delaying their gas field developments. Examples I am aware of are BGE&P's Olympus Project at Easington, Millom in the Irish Sea and some fields at Theddlethorpe.

TransCo's Supply Questionnaire

This year we have had a very poor response to our "Base Plan Assumptions" document and questionnaire. If we designed our system on the basis of producers' responses we'd have a peak supply of around 100 MCMD compared to the 400 MCMD we think we'll get for next winter. One major gas producer and infrastructure owner even suggested that TransCo design its system on the basis of WoodMac data! Of course, I've nothing against WoodMac, (we use them extensively and value their opinions) but I would not expect Ford to build a car plant based on Jeremy Clarkson's view.

Why such a poor reply? I'm not sure, but I believe that caution remains upstream when it comes to dealing with the TransCo Business Unit of BG plc, largely as a result of take or pay issues. TransCo is very tightly regulated as regards information flows to BG Trading or any shipper/supplier and we take our obligations very seriously. We have commenced a dialogue with UKOOA in order to try and improve the flow of information to ensure that the supply and demand relationship is properly managed.

Increasing Offshore Alerts

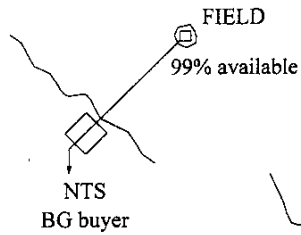
These new supplies represent good news. However, there are signs that new and existing gas fields are not performing as well as they used to. TransCo has seen this in an increasing number of Offshore Alerts that took place during last winter when there were a significant number of high demand days for the first time for years. It can be argued that worsening offshore reliability is correct economically, because there are better ways of spending money than building plant in the centre of the North Sea...

CRINE and Availability

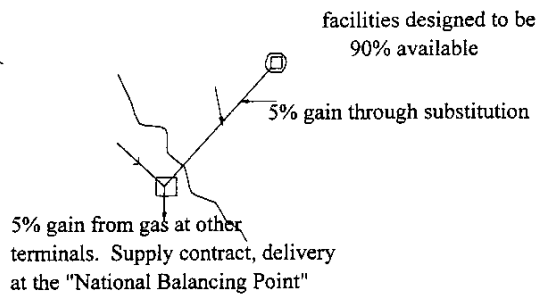
When BG was a monopoly buyer prior to the 1990's, it bought gas on dedicated depletion contracts. Within these contracts, one set of terms related to the obligation on the producers to install facilities of a high standard with severe penalties for failure to supply, such as shortfall and even supershortfall. If the gas did not leave the platform, BG would impose financial penalties. This meant that a lot of standby capacity was installed out in the North Sea. **Those days have gone.** Gas is now sold on supply contracts with lots of opportunities for the producers to obtain gas to satisfy their obligations. Instead of building a 99% availability platform and facilities, save £50 million by building a much smaller 90% available platform (for example, install a single train or 2 @ 50% capacity rather than 2 @ 100%). Pick up another 5% availability from offshore substitution and another 5% from your gas at other terminals and you're OK. I wonder how much of gas field CRINE is due to the existence of a market for gas that avoids investment in high offshore performance? This is shown below. If the saving is just 10% of CAPEX, then we may be looking at £700 million saving from the projects that are coming on stream in 1996-1998. If even part of this £700 million was invested we could have many more salt cavity stores and new LNG facilities. We could even have an offshore competitor for Rough.

DECLINE IN GASFIELD AVAILABILITY

OLD WORLD



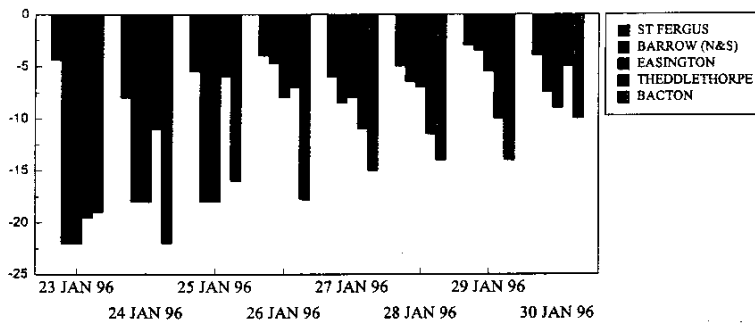
NEW WORLD



The problem with replacing physical availability with commercial availability is that, on a peak day when maximum beach flows are required, the gas is not there. I can illustrate this with a graph showing what we expected and what we got in a high demand period in January this year.....for all terminals we got a certain % less than we expected.

TERMINAL FLOWS - COMPARED TO MAXIMUM

23rd to 30th January 1996

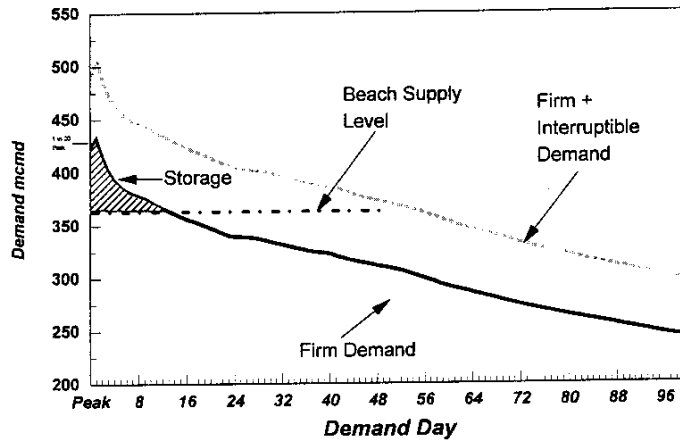


Producers and Storage

What should happen is that producers book capacity in Rough to replace the lost gas on the peak day (I was also going to suggest Hornsea, but that has been fully booked for 1996/7). Interestingly, there are two distinct camps when it comes to an opinion on TransCo's Storage tariffs. The users of these services tend to believe that TransCo's storage tariffs are high. (Maybe they are if you really believe you can buy gas at 9p/th on the spot market on a cold winters day..... I suspect that it will prove to be a very small spot at demand levels above 85%.) On the other hand, when we speak to developers of new storage facilities, they complain about predatory pricing by TransCo. The reality is not predatory pricing, but shippers and producers have a low opinion of what storage is worth, hence no new projects and relatively low bookings of TransCo storage. Give us a few seasonally normal cold days during a winter of daily balancing and I am confident that producers will be booking much more storage next year. Below, the 1995/6 Load Duration Curve is shown. I would recommend that all producers and shippers study that curve, especially days 1 to 20.

Supply/Demand Curves

1995/6 Severe (1 in 50) LDC



Producers and the Flexibility Mechanism

The Network Code and Licensing Regime is now in place. It is straight forward for a producer to become a Shipper. Pop down to the Post Office, pay a few bob to buy a Licence from OFGAS, have a word with TransCo, sign the Network Code, nip into Dixons for a computer, plug it in and away you go. Easy as pie. Then sit back and wait for demand to go up, for other supplies to fail. Then sell good reliable gas at very high prices, £1.50 a therm or more? Why not?

If any producers are not becoming shippers for next winter, then they're "do lally".....you'll kick yourself when prices are high and someone else makes the money....if I were you, I would not risk my management saying to me in mid January 1997 "Hey you, why haven't we got access to all this money, get us a Shippers' Licence NOW".....I have copies of TransCo's "How to be a Shipper" brochure if you're interested.

Expansion of TransCo Capacity

Turning to transportation capacity, TransCo is progressing a number of major expansion projects in order to provide more capacity from St Fergus and Teesside. Depending on actual customer requirements, we may spend around £300 million prior to October 1998.

TransCo Engineering for Value

For all these projects, TransCo is applying radical Engineering for Value concepts. EfV is very much the same as CRINE. Out have gone BG specifications, replaced by industry design codes. In the past there may have been examples of belt and braces - **those days have gone**. For example, look at how we might design and build a two RB211 sized compressor station.

Compressor Station

The message I'd like to give you here is that TransCo today has gone through an enormous transformation. No ironing socks these days. The successful introduction of the Network Code represents a major triumph for the new TransCo culture. For compressor stations we intend to show that we are the best in the world.

Previously, the cost may have been around £32 million. This becomes £30 million when BG standards are replaced by industry standards. Then £29 million if we remove the need for the inlet gas scrubbers we used to install "just in case" the producers put some off specification gas into our system, causing liquid drop out. Far better for TransCo to stop this gas coming in to its system in the first place? Next, we will critically review the civils, perhaps removing the need for any fixed building, as all our compressor stations are now operated remotely from System Control in Hinckley. Then consider an absolute minimum of tarmac roads and security fencing. The new compressor station will not look as attractive as the existing ones do and will not have any architectural cladding, but we've now got the costs down to £26 million?

To go lower, why not install Electric Drivers on the compressors...£20 million? Finally, if we remain with gas, why do we need two machines? Why not apply the CRINE principle of building less standby and getting the gas from elsewhere. Thus £17 million can be achieved? I am not sure how many of the savings below £30 million will be achieved when all value factors are taken into account, such as planning, environmental, health and safety, the Fire Brigade and the desire of our customers to retain around 99.99% availability. However, all our customers can be assured that our commitment to value is ruthless.

TransCo Capacity and Gas Supply Availability

It is not always understood, but in an integrated system there is a close relationship between where gas is landed and TransCo's capacity to move that gas. For example, we have a lot of capacity to move gas from Bacton, much more than the actual gas production on a peak day. However, we may not be able to accept gas from Partington at the same time as maximum flows from Morecambe. Similarly, Glenmavis may be competing for capacity with St Fergus when St Fergus is at peak.

At the present time, we believe we can satisfy the aspirations for transportation capacity at all terminals in winter, with some constraints during summer. For example, to export maximum gas from Barrow we rely on high demand in North West England. Thus in summer we cannot always flow at the Barrow peak. Similarly for St Fergus - with low demand in Scotland, we have less capacity to take St Fergus gas even if we can do a great deal by running more compressors. In the table below, TransCo capacity is shown along with the expected gas flows.

1996 BASE PLAN ASSUMPTIONS									
(mcm/day)		MAXIMUM ENTRY CAPACITY	1995/6	1996/7	1997/8	1998/9	1999/0	2000/1	2004/5
Supplies	St. Fergus	103	97.1	95.2	94.7	113.1	112.6	114.1	141.7
	Easington	42.2	37.1	35.6	33.2	30.4	26.9	34.1	23.9
	Theddlethorpe	70.9	37.3	49	47.1	40.6	36.7	33.5	31.8
	Teesside	11.4	9.7	11.4	27.9	38.1	37.9	37.6	26.5
	Bacton	155	97.7	101.7	98.6	91.7	90.8	82.3	85.1
	Barrow	61	55.3	52.1	48.9	48.2	46.6	55.4	59
	SUB TOTAL		443.5	334.2	345	350.4	362.1	351.6	357
Storage	Rough	42.5	0	18.3	20.6	21	37.2	39.1	42.9
	Hornsea	17.6	4.2	11.2	11.2	11.2	11.2	11.2	11.2
	Glenmavis	10.3	4.6	4.3	4.3	0	0	0.9	0.9
	Partington	24.7	11.8	9.1	9.1	9.1	9.1	9.1	9.1
	Dynevor Arms	5.1	3.5	2.3	2.3	2.3	2.3	2.3	2.3
	Avonmouth	15.4	10.9	8.4	8.4	8.4	8.4	8.4	8.4
	Isle of Grain	22.7	15.5	10.4	10.4	10.4	10.4	10.4	10.4
	SUB TOTAL		138.2	50.4	64	66.2	62.4	78.6	81.3
TOTAL		581.7	384.6	409	416.6	424.5	430.1	438.3	453.1

The maximum entry capacity figures are prior to reinforcement taking place in 1996-98.

Demand Side Developments in 1996 to 1998

The demand side of the equation is becoming much more complicated as a result of a number of effects:

- * UK I&C market growth
- * Gas Fired Power Generation growth
- * Interconnector flows to Ireland and Belgium
- * Interruptible to firm switching

Industrial and Commercial market growth

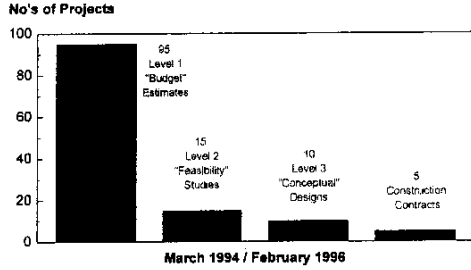
We have a small team in TransCo that looks at Supply/Demand. As I said earlier, we are having difficulty on the Supply side. Demand is no easier. TransCo has lost its direct contact with the I&C market as it is now individual shippers who talk to end consumers and pick up demand trends. We are working to improve our links with shippers to get back some of the knowledge we have lost.

To date we have not seen any great signs that low prices have caused an increase in demand. However, my Mum says that her Church is now happily roasting because they get their gas from Norweb Gas at about half the previous price. Assume there are lots of other churches buying gas from Norweb Gas and.....

Power Generation Growth

The exception to this lack of knowledge is the power generation sector. We have a combined commercial and technical team that provides a "one stop shop" service to developers and shippers in the power sector. In the past two years, we have had around 95 enquiries for new NTS connections. Of these 95, only 5 have actually signed agreements for a connection. This take-up is shown in the graph below. We are doing our best to improve on this - I had hoped to be able to hand out copies of our "Connections Made Easy" brochure at this Conference. However, the connections have now been made so easy that we are having to re-write it!

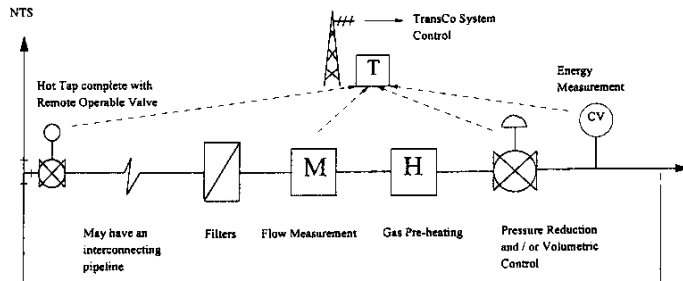
Power Station and Large Projects March '94 - February '96



TransCo Exit Connection Policy

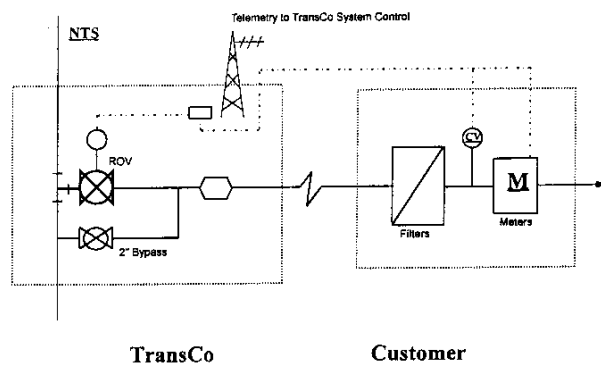
In the past when you wanted to connect to the high pressure system, TransCo policy required valves, regulators, FCV's, ESD's, filters, meters, standby capability etc. This is shown below:

Historic Large NTS Offtakes



Those days have gone. The minimum requirement is now a hot tap and a remotely operable valve - the rest the customer can build himself. We will look after our interests commercially rather than by engineering design and control. Safety remains a top priority.

New TransCo Connection



For new connections, we offer the following schedule:

- Budget estimate for a connection within 7 days
- Fixed price offer within 30 days
- Installation completed within 180 days

We think this is as about as good as it can get and, we hope, will stimulate more connections

Pity the Poor Lawyers and Consultants

The last few years have seen a lawyers' and consultants' gravy train chugging through the gas industry ... for dealings with TransCo, that train is coming off the rails..... we are passionate about simplicity and openness.

- * **Simplicity:**
 - we are putting in place a suite of simple and clear standard agreements that are required to connect to the TransCo system. Our aim is to have minimal negotiations, maximum advice and to win a plain English award too!

- * **Transparency:** - we now publish full technical details of our high pressure system....buy yourself a copy of the "Falcon" gas flow simulation model and you can sit at home on your PC watching Coronation Street, pretending to be a TransCo System Controller! I doubt whether any other pipeline system in the World has such openness.
- * **Pricing Model:** - later this year, we are also publishing a package that will allow shippers and producers to calculate what our charges will be under different pricing methodologies.

Interruptible to Firm Switching

As a result of the cold weather on days in January, February and March this year, TransCo had to call on its rights to interrupt gas supplies. After about 6 consecutive mild winters, the consequences of cold weather came as a surprise to many end consumers. Global warming temporarily suspended?

During the early 1990's BG increased the price of Interruptible gas. With the crash in gas prices during 1995, firm gas can now be bought at prices significantly below previous interruptible prices. As a result of the Network Code and daily balancing there is now a greatly increased chance of interruption for individual shipper balancing purposes. This and low firm gas prices are causing more end consumers to consider moving to firm.

How much switching we are able to do depends on location and the detailed design of TransCo's system. Clearly, the extra capacity we are installing for October 1998 will offer some opportunity for loads to go firm.

New Services

At present an industry wide Consultation is underway on TransCo's capacity regime. Should we be moving towards Contract Carriage? I could go on all day about this, but it can be a superficial discussion which always has people like me saying "Yes, yes, but what does that actually mean??" At the end of this presentation I will touch on some of the actual advantages of operating under a Common Carriage regime.

Whatever the outcome of that debate, we are determined to introduce service products as a means of increasing the utilisation of our system and of giving our customers maximum choice. Ideas we have include such things as 15 and 30 day interruptible services, monthly contracts for capacity, variable TNI (TransCo Nominated Interruptible) contracts.

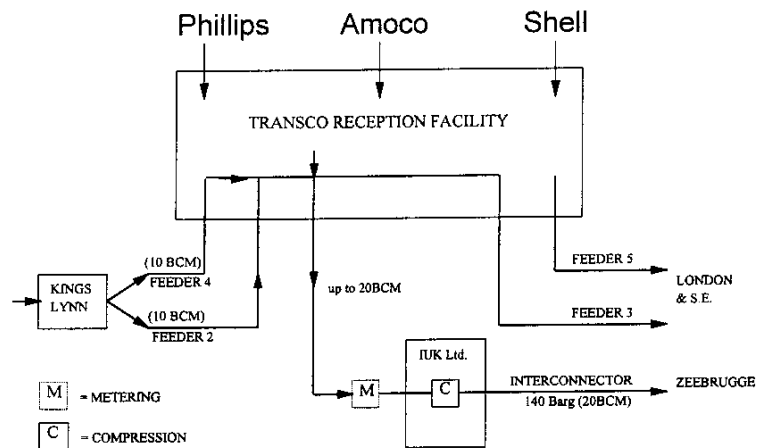
If, as a result of pricing and service development, we can encourage British Steel to make more steel in summer rather than winter, we'll all be winners.

Interconnector Demands

There are Interconnectors to Ireland and Europe and my team is in discussion with shippers looking at markets in these places. However, what peak flows we will actually see through these pipelines remains highly uncertain.

We aim to bring negotiations with UK Continent Interconnector Shippers to conclusion by 1 August this year. This will allow 26 months for the necessary capacity to be installed. For information, I show below the new configuration of the NTS at Bacton that will exist from October 1998

CONNECTING IUK TO THE NTS AT BACTON



Value of Peak Gas

In setting out supply, demand and capacity developments over the next 3 winters, I am certain of one thing. Peak gas will become very expensive as shippers take on an obligation to supply their own demands on the peak day.

I used to work in BGE&P and was Commercial Manager on the Armada Project. One rule of thumb we had was 10% swing was worth about 1 p/th. In other words, for gas sold on 100% take or pay, we were neutral between 18 p/th at 130% swing and 17 p/th at 120% swing. I recall some discussions with a Regional Electricity Company and was amazed that they valued 120% swing as the same as 130%. I never found out why this economic nonsense applied until I joined TransCo and found out about monthly balancing.....shippers did not see the cost of balancing at all, as BG plc provided all the peak gas, free of charge.

Those days have now gone. Next winter, shippers will need to make proper arrangements for gas if they are to avoid high imbalance charges. We will soon know what the true values of peak gas and interruption are. I am a great supporter of the Flexibility Mechanism. Not as an end in itself, but as a means of stimulating liquid gas markets at terminals along the lines of the IPE or the BP/Conoco "TED Hub".

We do, however, probably need to go through a period of very high prices on peak days in order to unlock some of the rigidities in the market. I'm thinking of contractual terms that preclude players taking advantage of high gas prices arising under the flexibility mechanism. These include:

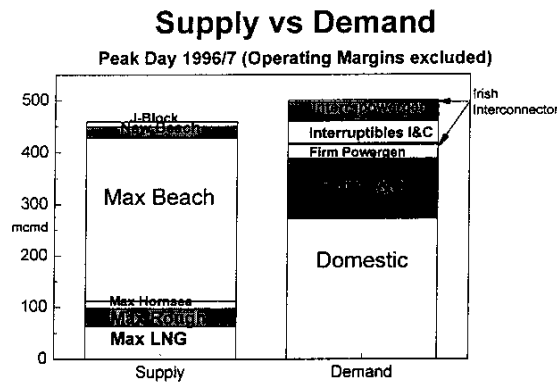
- * Power stations that are in dispute with their shippers (due to high gas prices)
- * Power stations that are not prepared to arbitrage between fuels because of risk
- * Interruptible sales contracts entered into by shippers that do not allow "commercial interruption"
- * Dedicated gas supplies
- * Reasonable endeavours obligations on supply of Excess gas
- * Limited within day information flows

Whilst I'd like to see prices staying low to benefit my Mum and her Church, there are some who would like to see gas at £10 per therm for a week or two next year in order to get some liquidity in the market. This could happen, given a further suspension of global warming and a continuation in the trend of increasing offshore failures..!!!

Summary

I have tried to paint a picture of what is actually going on in the UK market in terms of supply, demand and capacity on the peak day. TransCo is doing its bit to keep these three in the correct order by making investment and developing new services. Producers and Shippers will also need to take notice of these macro issues that could have a dramatic effect on price.

On a 1 in 20 peak day, if there is more demand than there is supply, under the Network Code TransCo books "top-up" storage. If there is insufficient storage available then TransCo will declare a lower security standard (eg 1 in 15, not 1 in 20). For this next winter, we expect a significant requirement for top-up, as illustrated in the graph below, which shows the position assuming all storage is booked. This should send a clear signal to the gas community that peak is becoming in shorter supply.



As Mr McCawber might have said:

If firm demand is 400 MCMD and supply is 405 MCMD, happiness

If firm demand is 400 MCMD and supply is 395 MCMD, misery

Advantages of TransCo's System

Finally, and not linked at all to my theme, I'd like to use this platform as a way of setting out some of the advantages of TransCo's system compared to direct pipelines from offshore. After all, we are not a monopoly....by 1998 we expect that 4 of our 7 reception terminals will be in competition with third party pipelines.

Back to the advantages, these include:

- * High reliability
- * Common Carriage and Network Code (with TransCo you do not have to put any gas in, in order to take it out - I'd like to see Contract Carriers like Forties, CATS, SAGE offer that level of service!)
- * Opportunity to save offshore CAPEX by designing a much lower level of availability
- * Access to a ready market for any surplus gas
- * Ability to blend off specification gas
- * Clear set of contract terms with minimal negotiation required
- * Low tariffs
- * Really nice people, willing to go out of their way to help