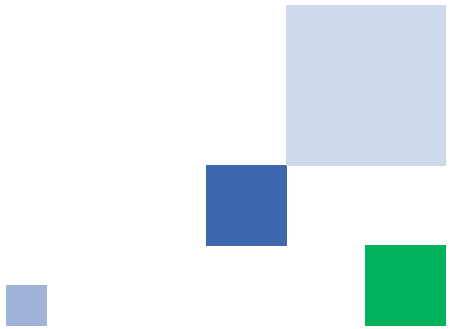
RWE npower

RWE

Security of Supply Issues

Ofgem Seminar, London
28 March 2007

Alan Robinson



Winter 2006/07 Looking Forward

- Uncertainty over new gas infrastructure
- Further decline in UKCS
- Impact of high gas prices on gas and electricity demand
- Availability of Rough
- Even chance that winter would be warmer or colder than average
- Plant margin 22% (same as last winter)
- Dungeness A & Sizewell A to close Dec 31st
- Coal expected to base load, gas at the margin
- Little/no demand-side response required in average/mild winter
- Sufficient gas to maintain supplies to NDM market in a 1 in 50 cold winter

❖ **So not quite out of the woods but it was looking OK.**

Winter 2006/07 Looking Back

- New gas infrastructure ahead of plan and flowing like gas is going out of fashion (IUK, Langeled & BBL)
- Excelerate LNG re-gas project commissioned
- Gas price reduced despite continuing high oil prices
- Rough fully available
- Winter much warmer than average
- CCGTs running baseload, coal at the margin
- Plant margin reductions due to BE outages had no real impact

❖ **The dawn of a new period of low gas prices or just a temporary relief?**

Summer 2007

- Events of 18 July 2006 were a combination of issues coming together – hot weather, CCGT marginal plant, Ratcliffe failure, higher level than usual of “on the day failures”
- Likely to see hotter summers (El Ninho impact in 2007?)
- Coal likely to be the marginal plant
- Summer outage programme not yet fully clear but FGD outages
- Low snow fall on continent so less stored hydro
- Conclusion – cannot rule out some tight days over the summer but will again require a number of events coming together to repeat July 18

❖ **The impact of gas on the electricity market has reduced but there are still some clouds on the electricity horizon.**

Large Combustion Plant Directive (LCPD)

- **By 1 January 2008 all large combustion plants (e.g. coal and oil-fired power stations) have to comply with LCPD by:**
  1. Achieving SOx, NOx and particulate emissions below threshold levels known as Emission Limit Values (ELVs); or
  2. Signing up to lower SOx and NOx bubbles that are equivalent to the ELVs and which are part of the National Emission Reduction Plan (NERP); or
  3. Opting out of ELVs and NERP and committing to close the station by 2015, operating for no more than 20,000 hours over that period.
- **Options 1 and 2 mean fitting Flue Gas Desulphurisation (FGD) equipment and making combustion modifications to reduce NOx.**
- **11.9GW of plant has gone for Option 1 (ELVs)**
- **9.6GW has plumped for Option 2 (NERP)**
- **13.0GW has gone for the Option 3 (Limited Life Derogation)**

❖ **So what has LCPD got to do with security of supply?**

The Consequences of LCPD

- **LCPD will have a potential impact on the power market, on the Balancing Mechanism and on security of supply in three time-frames.**
  1. Short term - Second half of next winter (i.e. Q1 2008)
  2. Medium term - Summer 2008 onwards
  3. Long term – 2012 to 2015
- **There will, no doubt, be enough Ofgem seminars before 2012 for us to discuss the long-term impact of LCPD which will arise from the forced early closure of coal and oil-fired plant. I will stick to the more immediate concerns.**
- **The underlying cause of the short and medium-term issues is the usual one that surrounds EU Directives being applied in the UK. The Directive was ambiguously drafted. It, therefore, took many years to clarify it sufficiently to enact it in the UK. Although some flexibility in the ELV versus NERP choice was achieved we have finished up with rules that it is very difficult to believe were what was actually intended when drafted.**

❖ **EU Directive + Gold-Plating = Unintended Impacts**

Short-Term Consequences of LCPD

- **There have been many delays in the process of clarifying the UK rules for LCPD. The original protracted debate was whether it should be based on ELVs or NERP. For some generators this choice made the difference between it being economically viable to retrofit FGD and having to opt out.**
- **Eventually it was agreed that the ELV versus NERP choice did not need to be made at the UK level but could be left to individual power stations. The initial decision was announced in 2005, with final details in early-2006.**
- **A lead time of only 2 - 2½ years is extremely tight for major engineering projects like FGD retrofits, particularly with 5 such projects running in parallel across the country.**
  - Aberthaw 1.5GW (3 units)
  - Ferrybridge 1GW (2 units out of 4)
  - Fiddlers Ferry 2GW (4 units)
  - Longannet 2.5GW (4 units)
  - Rugeley 1GW (2 units)
- **With a deadline of 31 December 2007, there will be reduced availability during 2007 for outages. There must also be a risk that not all units are completed on time and so will either have to switch off or run at much reduced output during the early part of 2008.**

❖ **The LCPD transition could impact security of supply**

Medium-Term Consequences of LCPD

- **The most puzzling aspect of LCPD relates to the way in which the 20,000 hours derogation will work for the 13GW of opted-out plant.**
- **It seemed quite simple. Surely, each hour that a generating unit runs should use up one hour of its allowance. But such logical simplicity does not appeal to the Eurocrats. Something much more complex and expensive was clearly required.**
- **All of the UK's large coal and oil-fired power stations have a number of independent generating sets (boiler + steam turbine + generator). Each boiler has its own metal flue up which the exhaust gases flow.**
- **Those flues are surrounded by concrete cylinders (chimneys) that provide structural support and act as windshields. By an accident of history, some four-unit stations have one windshield and some have two.**
- **Brussels has deemed that the 20,000 hours applies to each windshield, not to each generating unit or flue. The result is that an hour of generation by any one unit counts as an hour used up by each of the units that shares that windshield. So the more windshield you have the more total generation is permitted.**

❖ **This 'Lack-of-Windshields' Tax is the modern equivalent of the Window Tax**

The Market Impact of LCPD

- The problem of trying to optimise the use of 20,000 derogated hours over an 8 year period is a complex one. The initial complexity of the Lack-of-Windshields Tax makes it very difficult to predict what precise impact there will be on the power market and the balancing mechanism.
- Simplistically for a four-unit, single-windshield station:
  - running one unit for an hour will produce 500MWh per derogated hour
  - running four units for the same hour gives 2000MWh per derogated hour
- Hence generators will start to think of their stations in multiple unit chunks and will place a value on each derogated hour used. For example:
  - overlapping unit outages may look more attractive than separate ones
  - running a single unit (Physically Notified or in the BM) would require a margin that would compensate for not being able to run 2 or 4 units at a later date
  - whole-station shut-downs across the summer may become attractive
  - spreading the start-up and shut-down times across units will be less attractive as the derogated hours clock starts ticking as soon as the first unit reaches minimum load and only stops when the last unit comes off.

❖ **Oh what a tangled web EU weave !**

Sir Walter Scott (almost)