

Gas Contingency Arrangements and Customer Demand Side Response 1 December 2005

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Demand side

- E.ON UK as a customer & shipper-supplier
- Commercial incentives
- Demand side products from your supplier

E.ON UK's position

- One of UK's the largest gas consumers
- By volume no. 2 gas shipper-supplier serving
 - domestic to large I&C customers

**Committed to coordinate our efforts to assist
Government/Regulatory Authorities in
avoiding/managing a gas and/or
electricity emergency**

Potential commercial demand side response

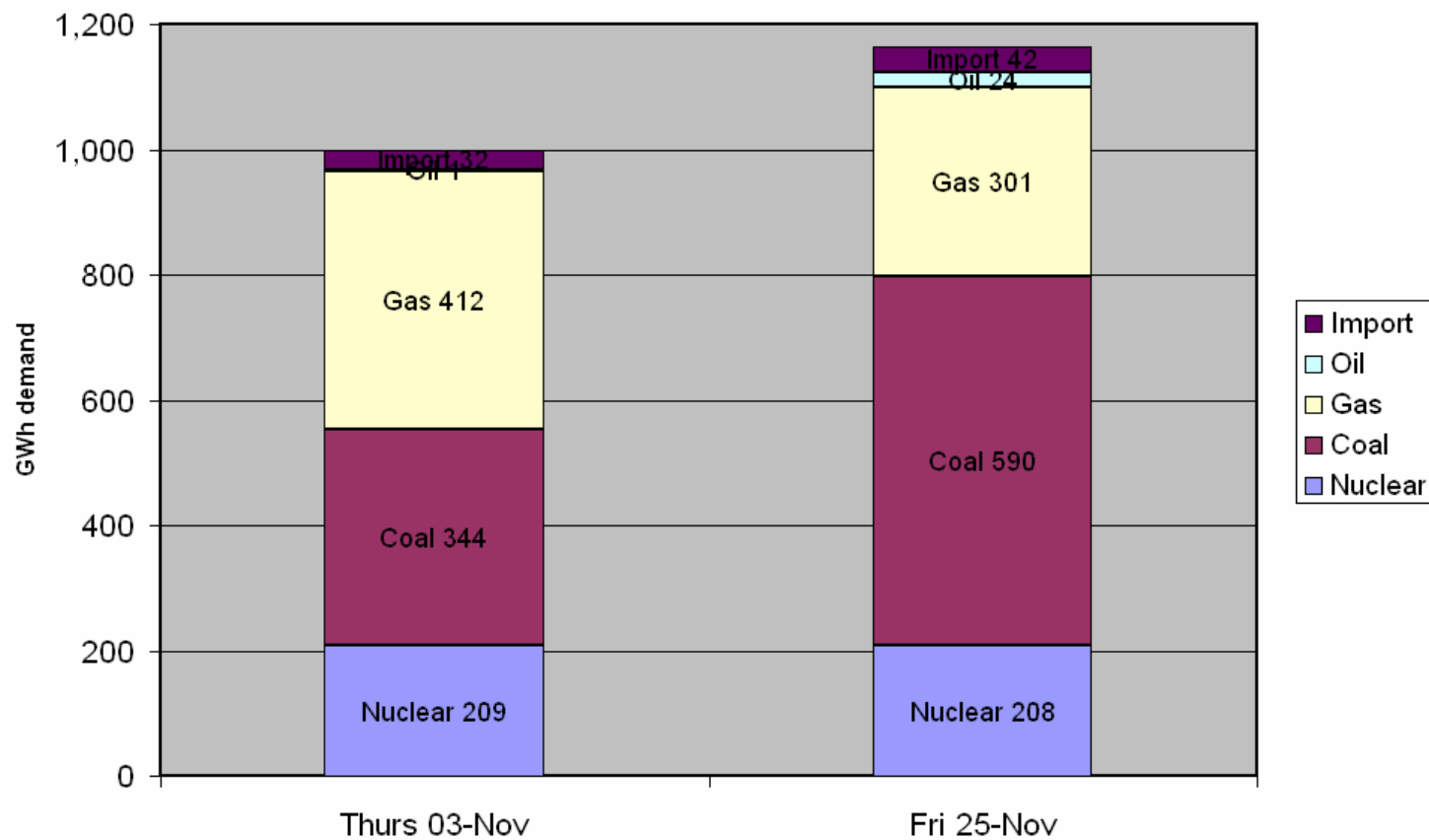
- Generators 700 GWh/day (24 m therms) during winter (Source NG Winter Outlook Report 2005/06)
- Other energy intensive users demand 100 GWh/day (3 m therms) – Source Global Insight.

Could provide around 15 to 20% of severe winter peak day demand?

Level of response is affected by:

- Wholesale electricity market prices
(Available generation capacity may be restricted by environmental constraints).
- Ministerial directions to operate particular generation plant in the case of an electricity emergency.
- Cost of alternative fuels.
- The values large users place on lost production.
- Routes to market to facilitate demand side response.
- Belief that a gas emergency is imminent.

GB Generation – demand side response



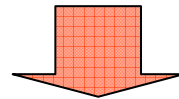
Commercial Incentives/triggers

- Cash-out prices for 'long' shippers designed to bring 'price sensitive' gas to the market
- Commercially incentivise demand side response from shippers through harsh emergency cash-out regime/ Emergency Curtailment Quantity Trade.
- Issue a Gas Balancing Alert (new)

Recent rule changes in an emergency and impact on commercial incentives prior to an emergency

Old Regime

- 1. 'Neutral' single cash-out price (30 day System Average Price)**
- 2. Claims process for 'long' shippers if costs not covered**
- 3. Rely on NG NTS to force demand side response?**



New Regime

- 1. Dual cash-out price (prevailing System Average Price and System Marginal Buy Price when emergency called)**
- 2. Claims process for 'long' shippers if costs not covered**
- 3. Demand curtailed by NG NTS reflected in an Emergency Curtailment Quantity adjustment sold at 30 day SAP**

Commercial Implications of Gas Emergency Procedures

Stage 1 - notice of potential emergency

- ⇒ Network Emergency Coordinator (NEC) can stop storage withdrawals, and instigate immediate curtailment of interruptible customers.
- ⇒ Emergency Curtailment Quantity (ECQ) adjustment to energy balance paid at 30 day System Average Price.

Stage 2 - declaration of an emergency (proper)

- ⇒ On the day commodity market suspended, nominations and entry allocations continue
- ⇒ Emergency cash-out invoked,
Long – Prevailing System Average Price when emergency declared
Short – SMP Buy at time emergency declared

Stage 3 - firm load shedding

- ⇒ ECQ adjustment to energy balance paid at 30 day SAP.

Stage 4 - system isolation

- ⇒ Diminishing supplies allocated to DNs for domestic users

Stage 5 - restoration

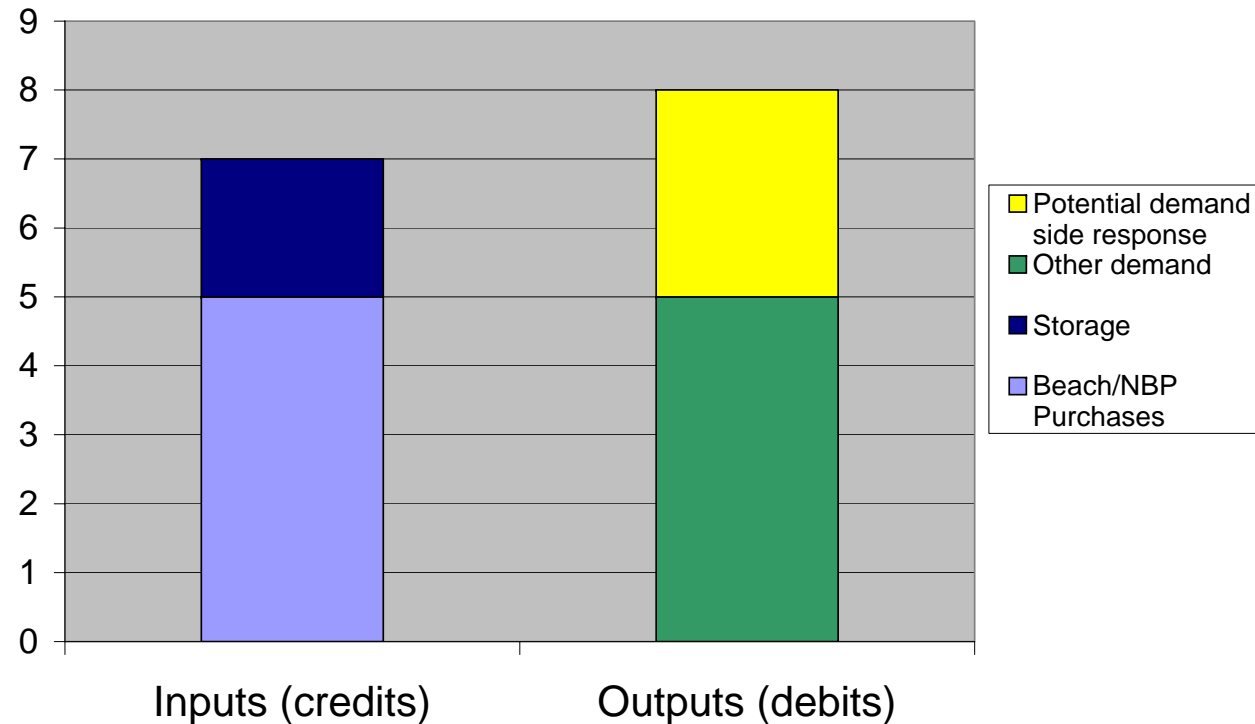
- ⇒ Normal arrangements restored at start of gas day (i.e. OCM restored and normal cash-out/no ECQ) when NTS operating at normal pressures.

Anticipated Shipper Daily Imbalance (Immediately prior to an emergency)

Prices?

**SMP buy =
£4.95/th**

**SMP sell =
£3.00/th**



Expected financial exposure = -£4.95m
i.e. 'Short' by 1m units cashed-out at SMP buy

Actual Shipper Daily Imbalance (following an emergency)

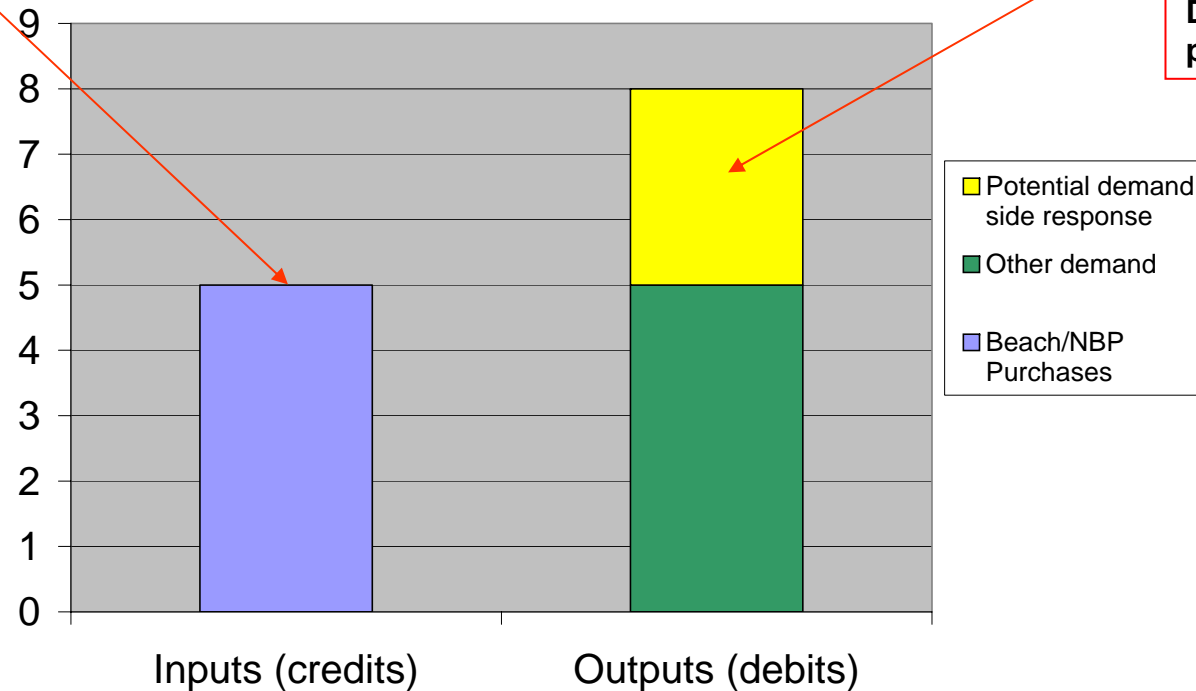
Storage
Curtailed by NG

Prices?

SMP buy =
£5.00/th

Prev. SAP =
£4.00/th

30 day SAP
= £1.50/th



Demand
Curtailed by NG
is sold at a
Disadvantageous
price

Actual Financial exposure = -£12m

'Short' by 3m units cashed-out at SMP buy = -£15m

Plus payment for 3m ECQ trade at 30 say SAP = +£4.5m

Less lost customer income of say = -£1.5m

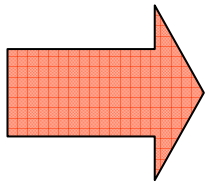
Gas Balancing Alert

**“Forecast Total System Demand is greater than or equal to the anticipated available supplies.”
(Issued at around 14:00 hours on D-1)**

- Defined to be a genuine indication of gas shortage (not ‘crying wolf’)
- Signals demand side response is need to avert an emergency

Demand side products from your supplier

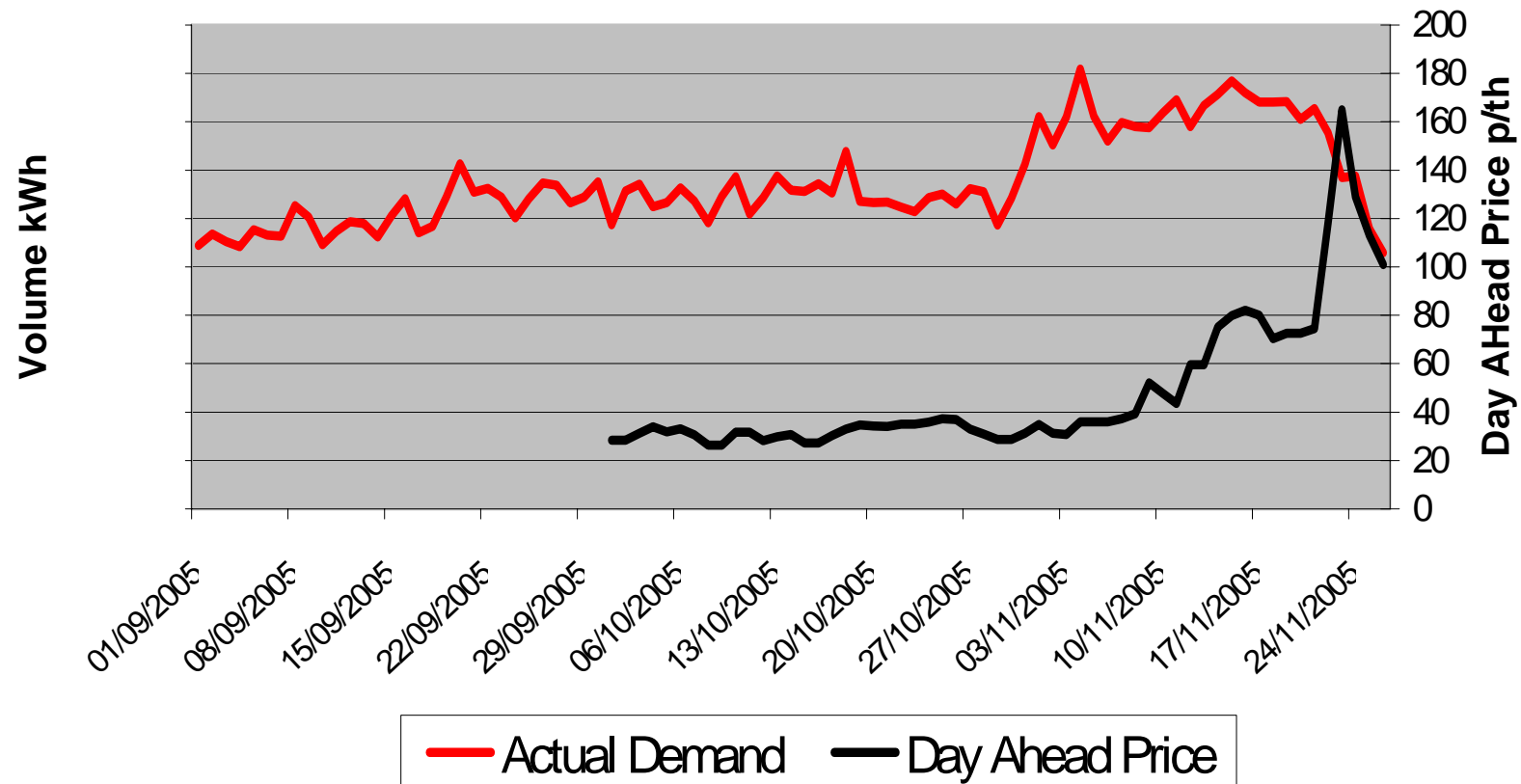
- Day ahead indexed prices – customer ‘self interruption’ when price too high?
- Emergency Sell Back



Customer sets price at which curtailment can take place

Recent demand side response - day ahead priced product

Allocation Vs Day Ahead Price



Emergency Sell back product

- Applies only when a Gas Balancing Alert is called or the NEC has invoked emergency procedures (also other predefined 'emergency' conditions specified by and agreed with customer).
- Customer sets an offer price and volume in advance at which it is prepared to allow curtailment.
- Shipper can exercise option to curtail.
- Failure to curtail demand cashed out at SMP buy price.
- Available to our larger daily metered customers.

Customer dilemma



OR



**Shut down +
Cash now**

**Chance it, & get nothing
in an emergency**

Conclusions

Generator demand side response together with substantial curtailment of other large gas consumer demand could help avert a gas emergency.

Strong commercial incentives on market participants are designed to facilitate this.

Evidence of demand side response at current high wholesale prices.