

UK Gas Production, Imports and Infrastructure

1. Potential UK Production

- a) Based on financial simulation model including Monte Carlo simulation of new discoveries.
- b) Field databases: (i) UKOOA database (ii) technical reserves, (iii) new discoveries.
- c) Threshold rate 15% real post-tax.
- d) Oil and gas prices (constant real)
 - (i) \$20, 18 pence
 - (ii) \$15, 14 pence
 - (iii) \$24, 24 pence

- e) No deferral of investment as consequence of 2002 budget.

2. **UK Gas Demand**

- a) Based on projections made by (i) DTI, (ii) Transco.
- b) These forecasts incorporate effects of Climate Change levy but not Climate Change Programme.
- c) Do they reflect slower growth in numbers of gas-fired power stations from fall in wholesale electricity prices?

Chart 1

Potential UK Gas Production and Demand including Exports

\$20/bbl and 18p/therm : 15% Threshold Rate

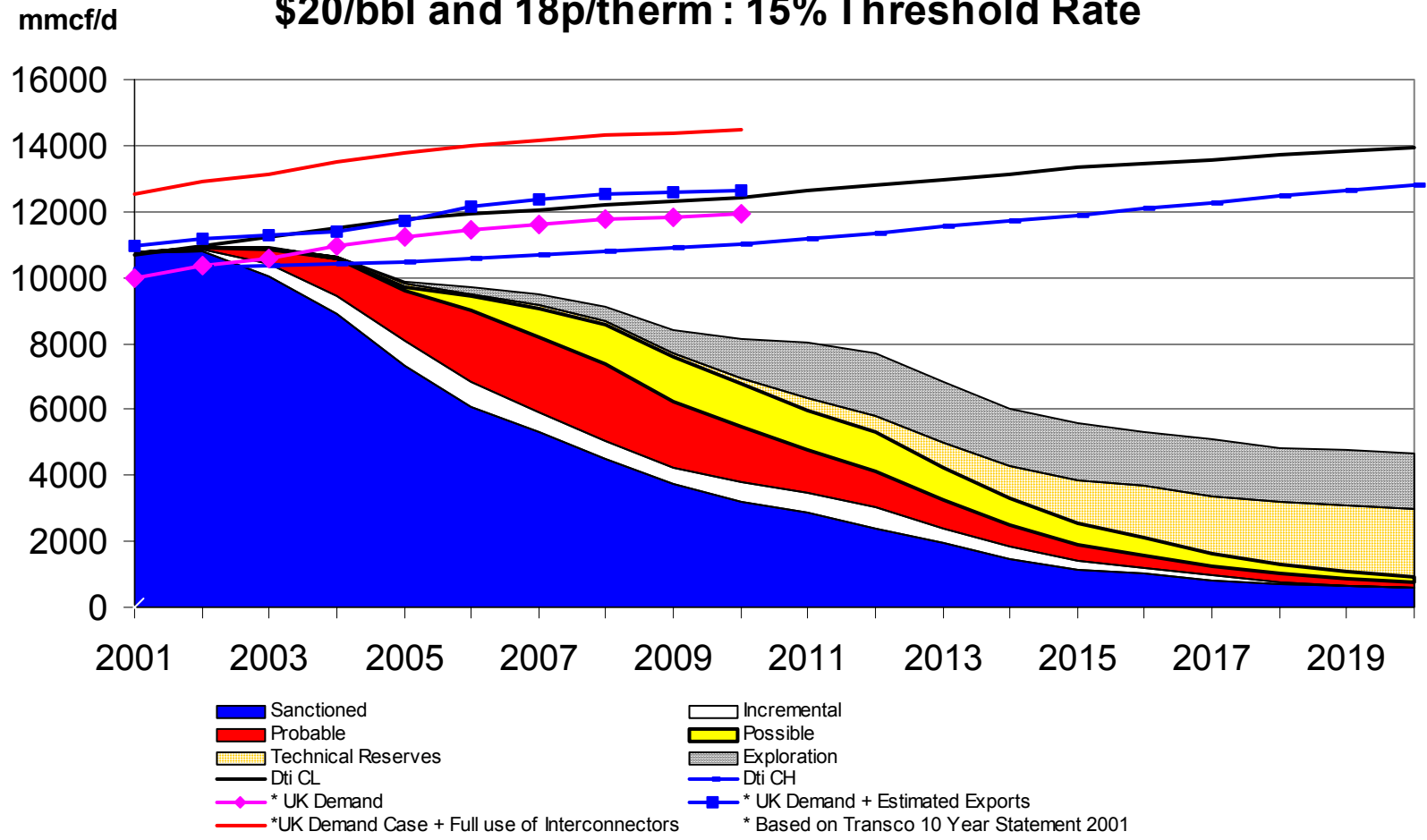


Chart 2

Potential UK Gas Production and Demand including Exports \$25/bbl and 24p/therm : 15% Threshold Rate

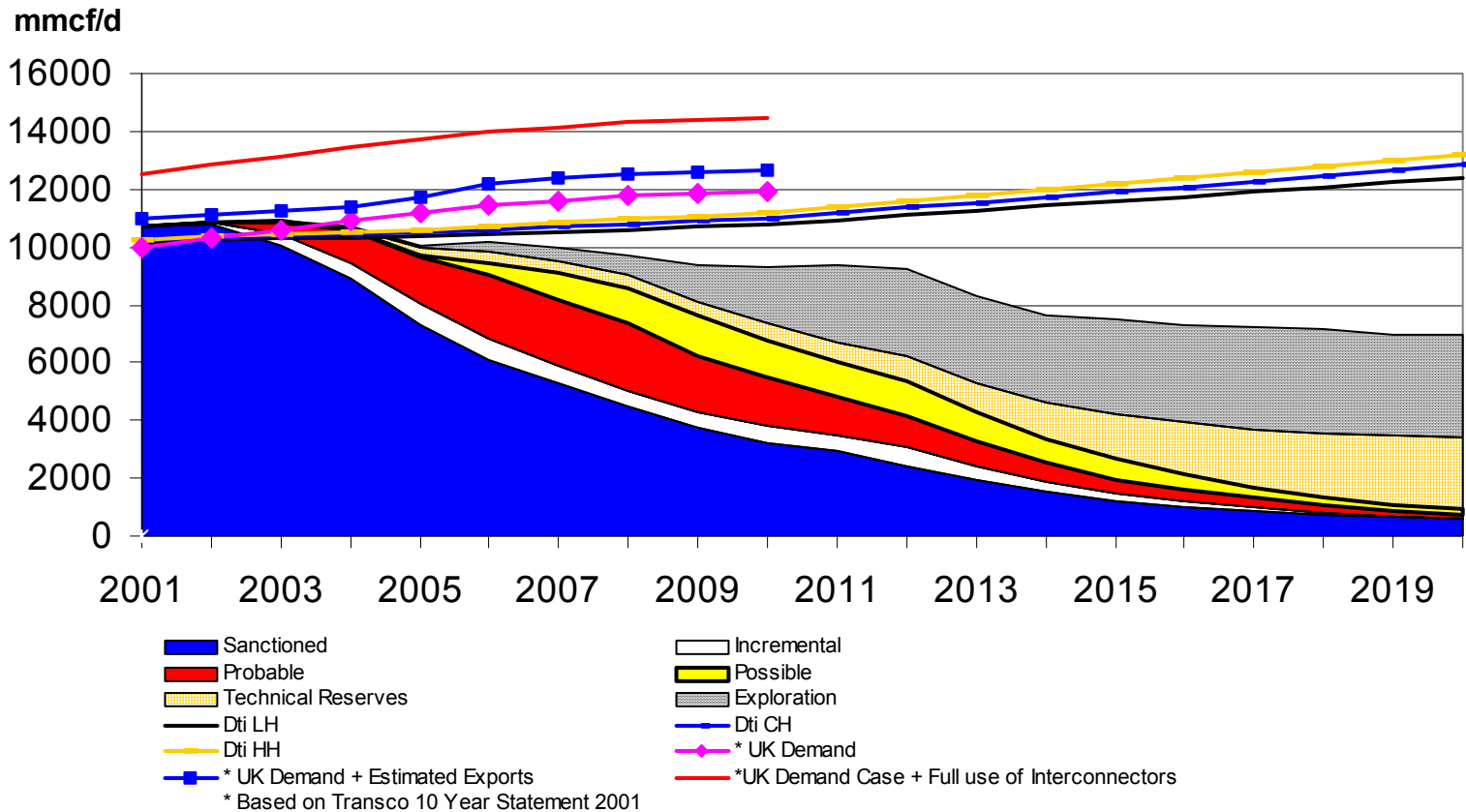
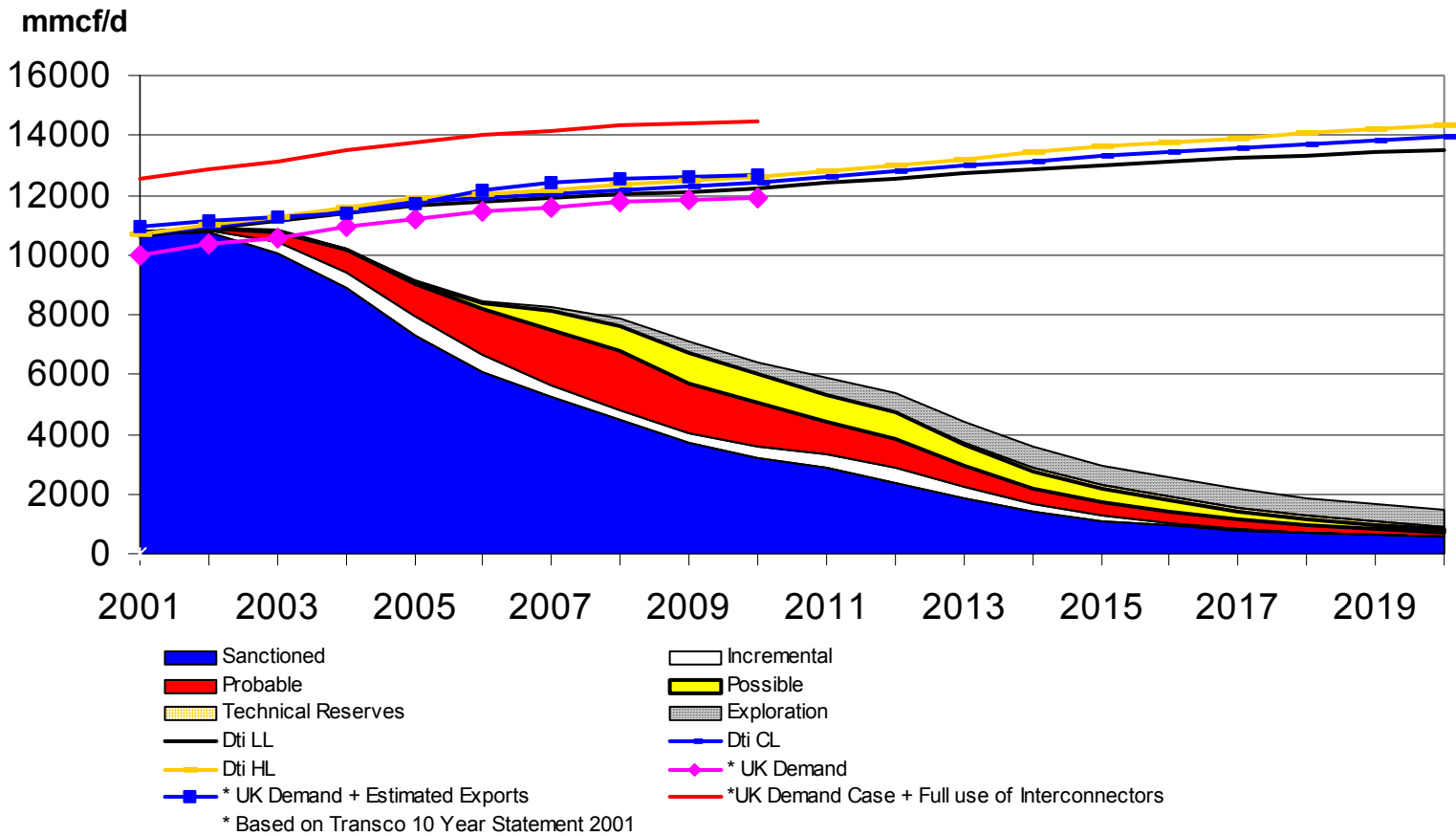


Chart 3

Potential UK Gas Production and Demand including Exports

\$15/bbl and 12p/therm : 15% Threshold Rate



3. Security of Supply – Current Situation

- a) Many interpretations and dimensions.
- b) Import dependence per se not a scientific indicator. What are risks attached to imports?
- c) UK gas production currently well-diversified. Over 100 producing fields. Largest producing c. 7% of total.
- d) Several separate terminals. St. Fergus and Bacton have several, separate sub-terminals.
- e) SAGE terminal handled 14.7% of total UK production in 2000.

- f) Indirect sources of risk very important. E.g.
 - (i) If Forties pipeline closed for some time over 30% of gas production could be shut-in.
 - (ii) Operational problems at NTS e.g. major computer failure, problems at large compressor station.

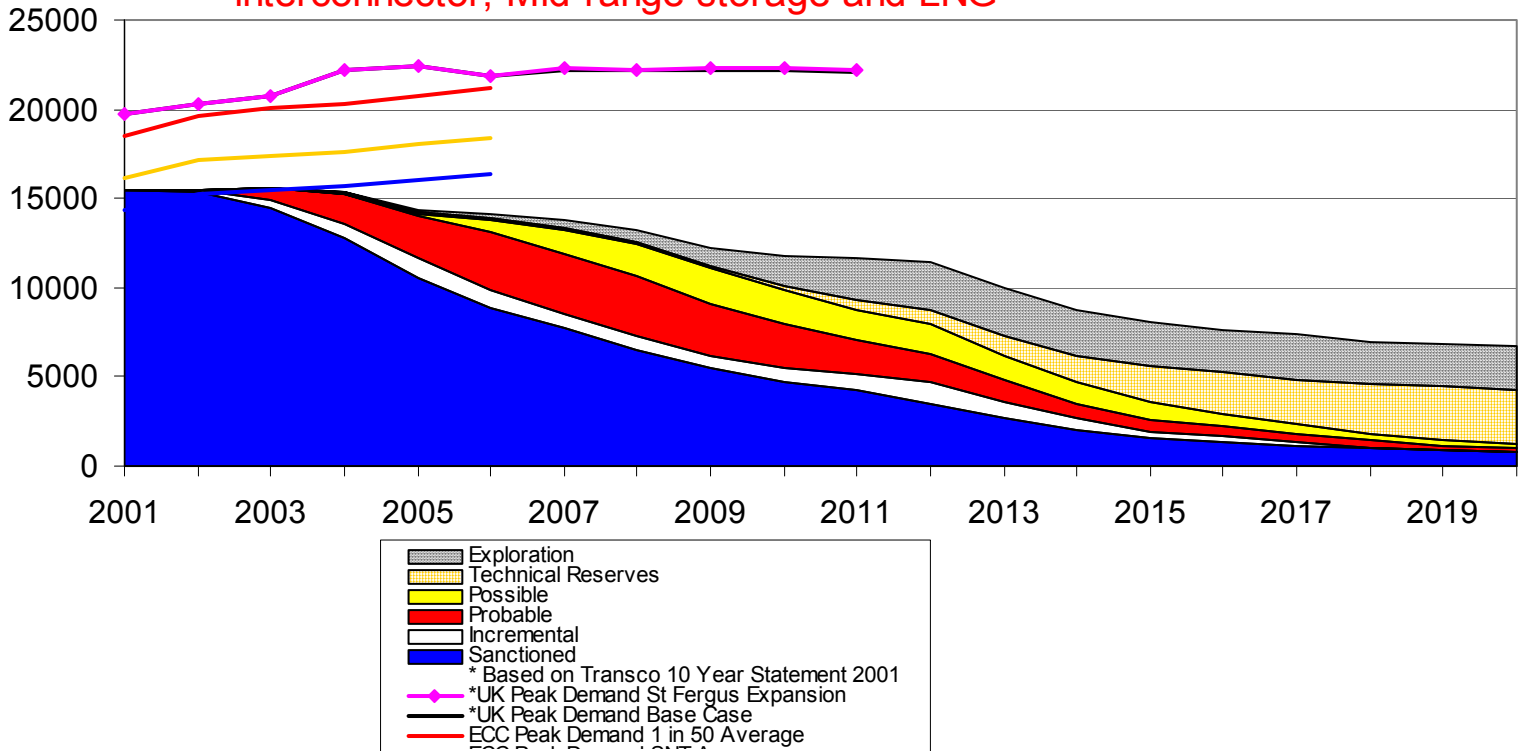
- g) Capability to meet peak demand. Chart shows conservative view of UK production swing factor plus Transco and Energy Contract Company estimates of peak demand. Significant expansion is required in gas supplies and associated infrastructure.

Chart 4

mmcf/d

UK Peak Gas Production and Demand \$20/bbl and 18p/therm : 15% Threshold Rate

Transco peak demand includes - onshore, Rough, Bacton interconnector, Mid-range storage and LNG



4. Promotion of Enhanced Security of Supply

- a) Incentives to maximise economic production from UKCS.
- b) Procurement of imports preferably on basis of:
 - (i) Competitive prices
 - (ii) Wide diversification
- c) Gas contracts appropriate to net buyer situation in liberalised market.
- d) Storage to help meet peak demand and emergencies.
- e) Adequate, flexible, onshore infrastructure.
Excess capacity margin as low-cost insurance?
- f) Demand-side measures to modify peak demand requirements.

5. Imports:

a) Reserves:

- (i) Ample proven reserves which would be accessed by UK. Remaining proven reserves for Europe = 172 tcf of which Norway 44 tcf, for Russia = 1,680 tcf, for Qatar = 568 tcf, for Iran = 812 tcf, for Algeria 160 tcf, for Nigeria = 124 tcf, for Egypt = 35 tcf and for Libya = 46 tcf. Total remaining should greatly exceed proven.
- (ii) In comparison total Europe consumption in 2001 = 16.6 tcf.

b) Accessing Imports

- (i) Infrastructure: Pipelines and LNG. Offshore and onshore.
- (ii) Several schemes for new offshore infrastructure Norway – UK being examined.
- (iii) Important to ensure that gas is transported to the UK at lowest resource cost. This entails substantial utilisation of existing infrastructure. Substantial ullage available now and more in future.

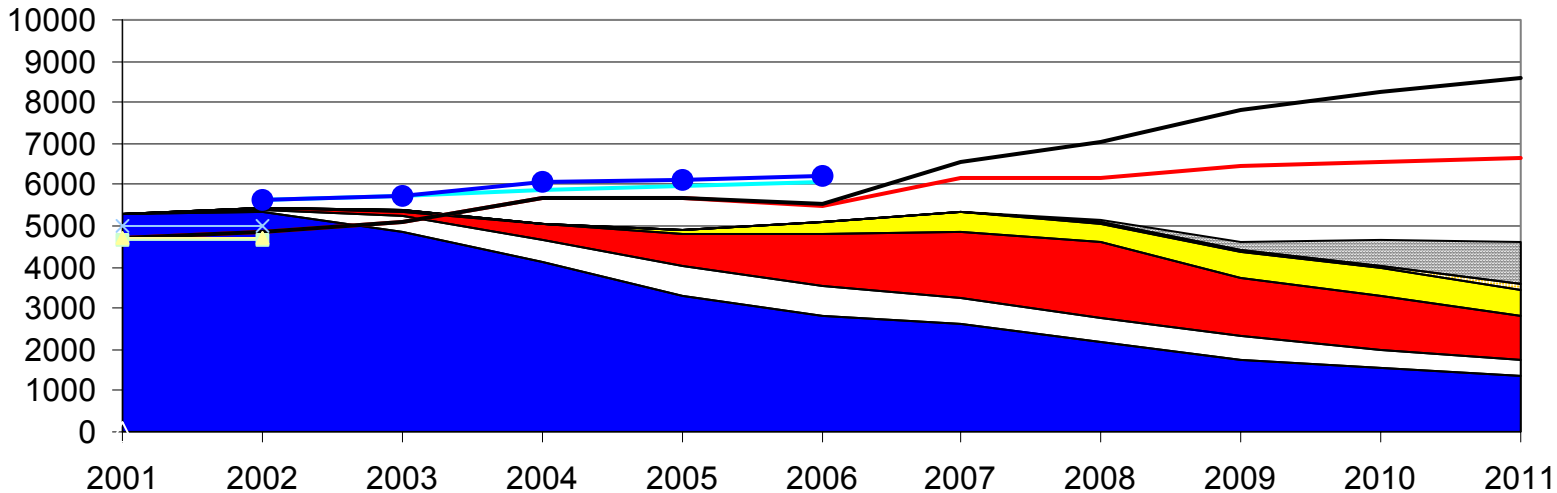
b) Accessing Imports (Cont)

- (iv) Taxation of tariffs currently exhibits non-level playing field among asset owners. Some 70%, some 40%, interconnectors 30%. Could distort investment decisions. How levelise?
- (v) Problem of NTS capacity bottleneck at St. Fergus. If not solved could result in non-optimal network of pipelines from Norway to UK. Will long-term capacity auctions produce optimal amount of capacity? Size of bids do not clarify required amount of extra capacity. Mixture of planning plus auctions could produce desired result where charges reflect LRMC.

Chart 5

St Fergus Peak Production and Capacity \$20/bbl and 18p/therm : 15% Threshold Rate

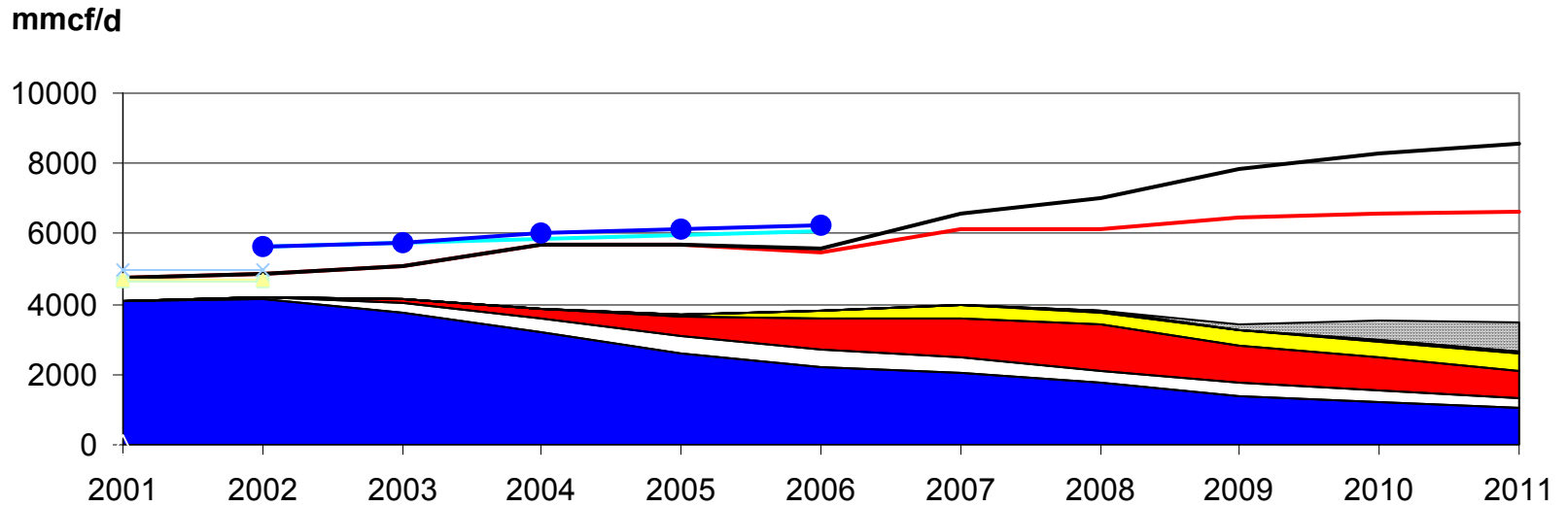
mmcf/d



- Exploration
- Technical Reserves
- Possible
- Probable
- Incremental
- Sanctioned
- Ofgem Maximum physical entry capacity (w inter, adjusted for summer flexibility outputs)
- Ofgem Maximum physical entry capacity (w inter)
- × * Maximum Monthly System Entry Capacity Available
- ▲ * Monthly System Entry Capacity Profile 2001/02
- * Max Capabilities 2001/02
- * St Fergus Expansion Scenario
- * St Fergus Base Scenario
- * Based on Transco 10 Year Statement 2001

Chart 6

St Fergus Average Production and Peak Capacity \$20/bbl and 18p/therm : 15% Threshold Rate



- Exploration
- Technical Reserves
- Possible
- Probable
- Incremental
- Sanctioned
- Ofgem Maximum physical entry capacity (w inter, adjusted for summer flexibility outputs)
- Ofgem Maximum physical entry capacity (w inter)
- * Maximum Monthly System Entry Capacity Available
- * Monthly System Entry Capacity Profile 2001[02]
- * Max Capabilities 2001/02
- * St Fergus Expansion Scenario
- * St Fergus Base Scenario
- * Based on Transco 10 Year Statement 2001

c) Contracts

- (i) Historically import contracts have incorporated large TOP elements which have reduced investment risks of producer and helped to ensure financing of development and transportation costs.
- (ii) In liberalised UK market buyers more wary of large TOP elements. Also, volume rather than depletion contracts more common and length somewhat less.

c) Contracts (Cont)

- (iii) Size of buyer and his financial strength important to conclusion of effective contracts. Small buyers may find it more difficult.
- (iv) Effective contracts also facilitated by presence of forward/futures markets with adequate liquidity for some years ahead.
- (v) From viewpoint of UK as net buyer in liberalised market price indexation to such conditions is important (incorporating, for example, spot price as one factor).

c) Contracts (Cont)

(vi) UK's interests also require peak gas.

(vii) Encouraging progress with recent import contracts – BP plus 2 Centrica contracts could satisfy 36% of import requirements by 2010. ExxonMobil plans in addition.

(viii) Can free market provide adequate storage for peak demand requirements?

(ix) UK will require substantial (imported) quantities of wet gas particularly for petrochemical plants. Norway, as member of European Area, should be discouraged from putting obstacles to free trade in wet gas.