

UK energy policy: challenges and responses

Tera Allas
Energy Market Economics
Department of Trade and Industry



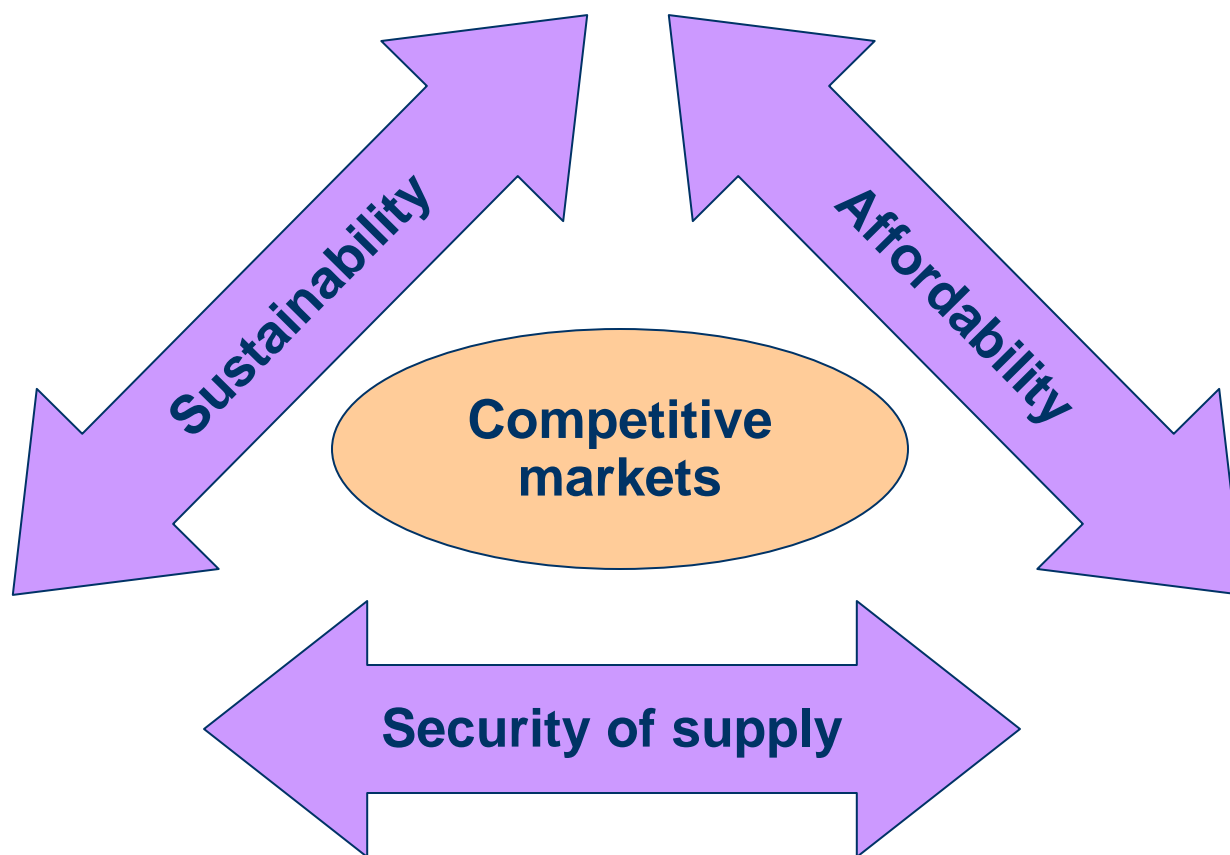
19 September 2006

Today's discussion

- **Overview of our energy policy framework**
- **Key short- and longer-term challenges**
- **Market response to challenges to date**
- **Government response to challenges**

We want secure, sustainable and affordable energy delivered by markets

Appropriate framework



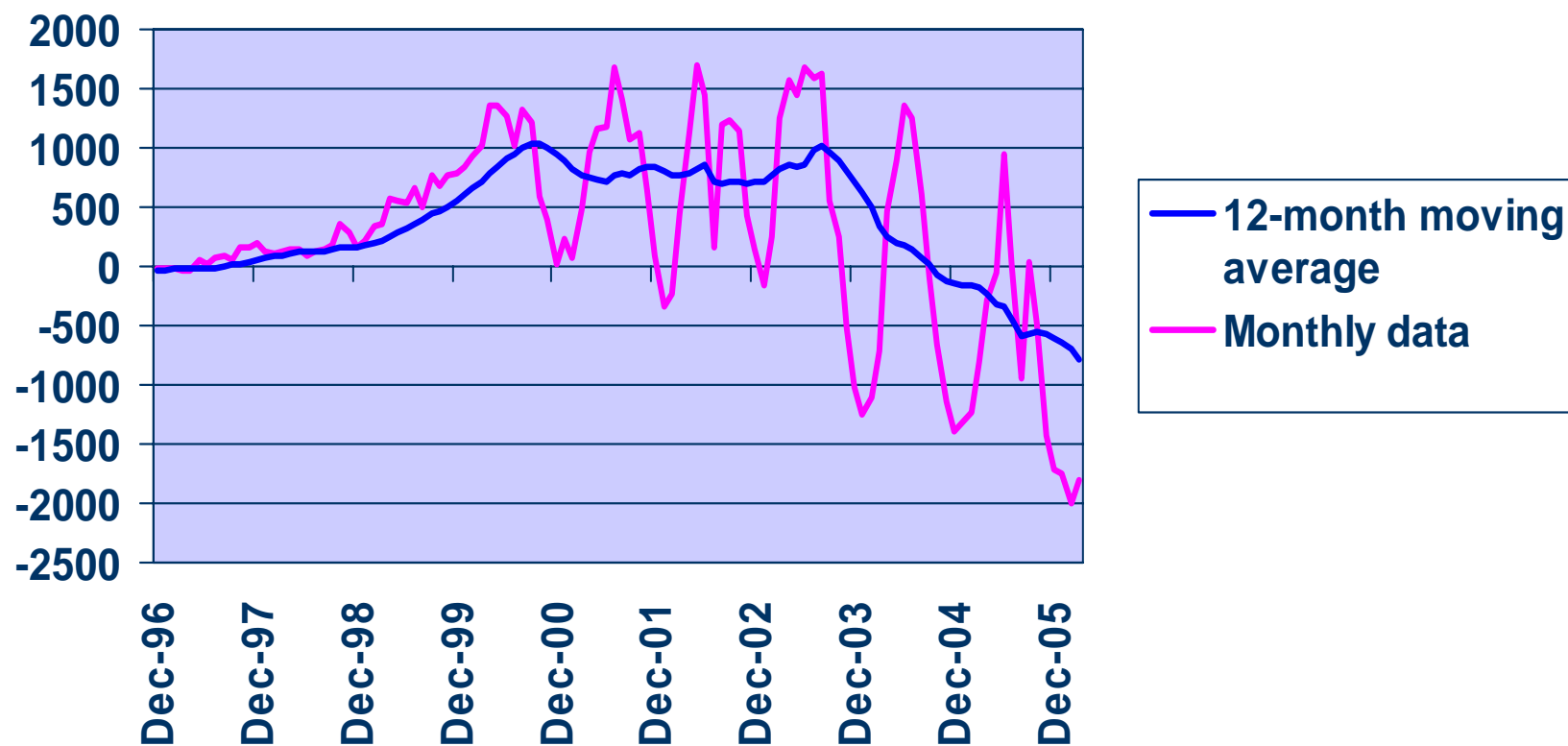
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The UK market is facing a rapid transition to being a net-importer of gas

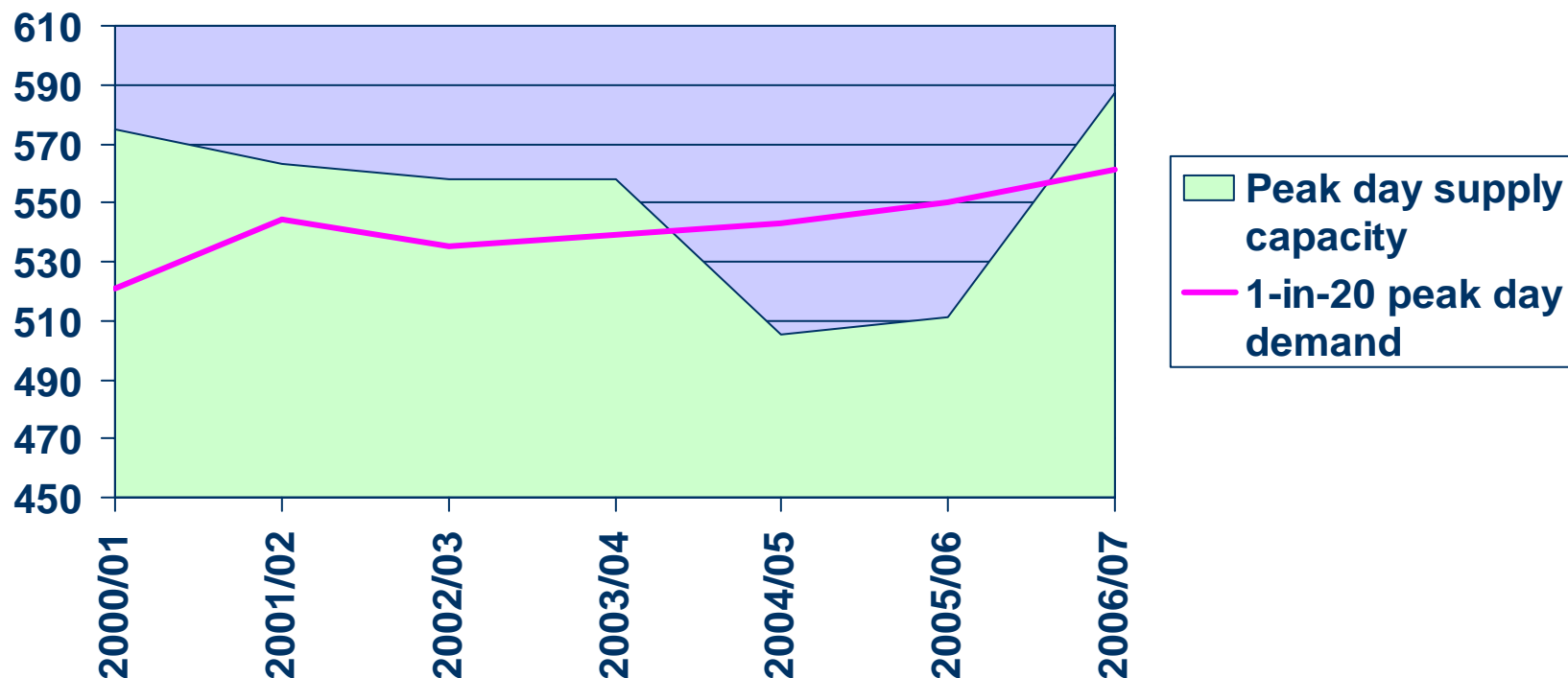
Monthly net exports of natural gas in the UK

Mcm



As a result, the supply/demand balance has been stretched especially in winter

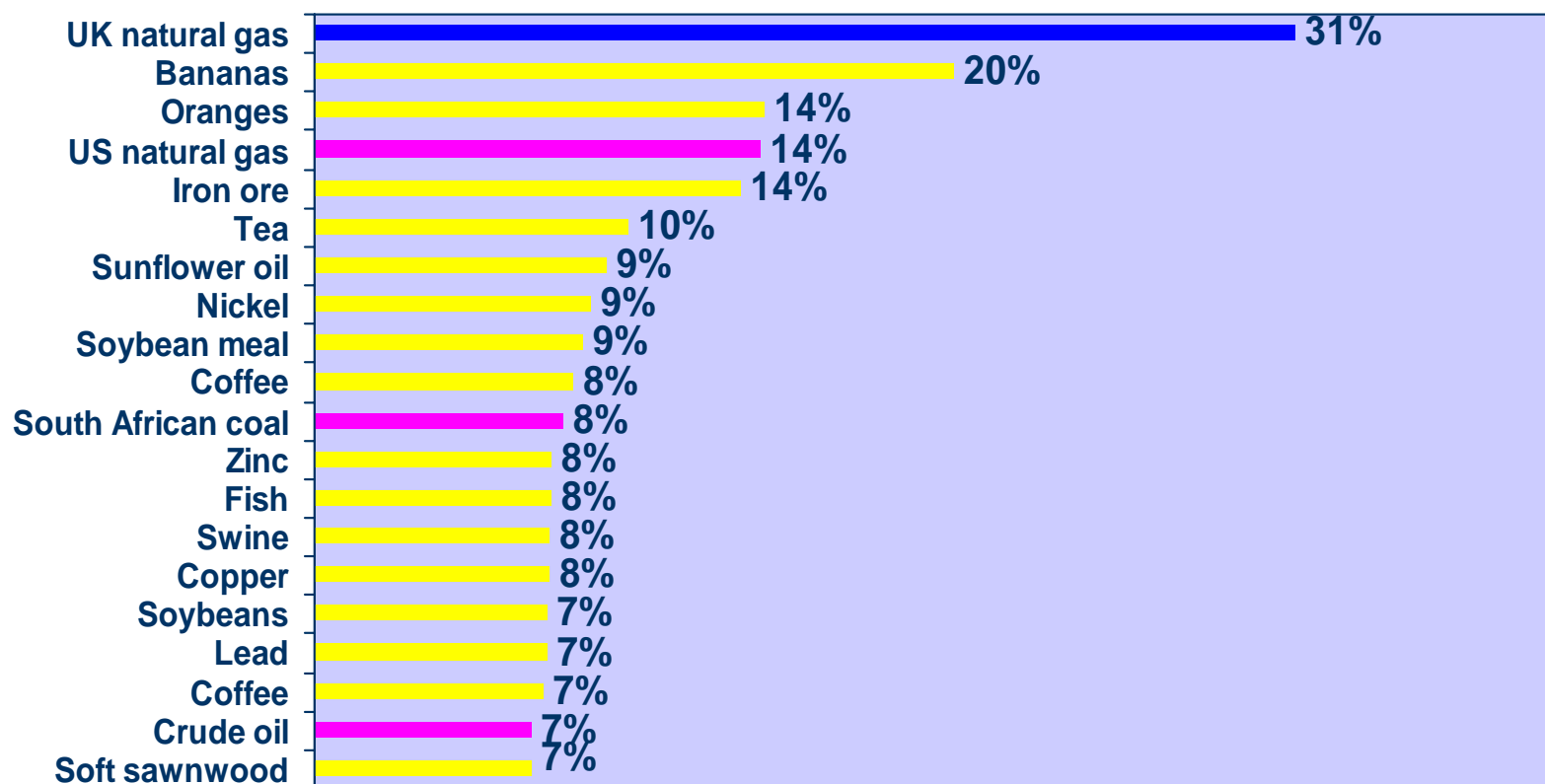
UK gas market peak day demand and supply capacity*
Mcm/day



*As reported in each TYS for the first year in that TYS; 2005/06 from TYS 2005; capacity does not mean molecules
Source: NG Transportation Ten Year Statements 2001-2005; DTI analysis

UK wholesale gas prices have become the most volatile commodity in the world

Standard deviation of monthly returns of most volatile commodity prices*
Percent

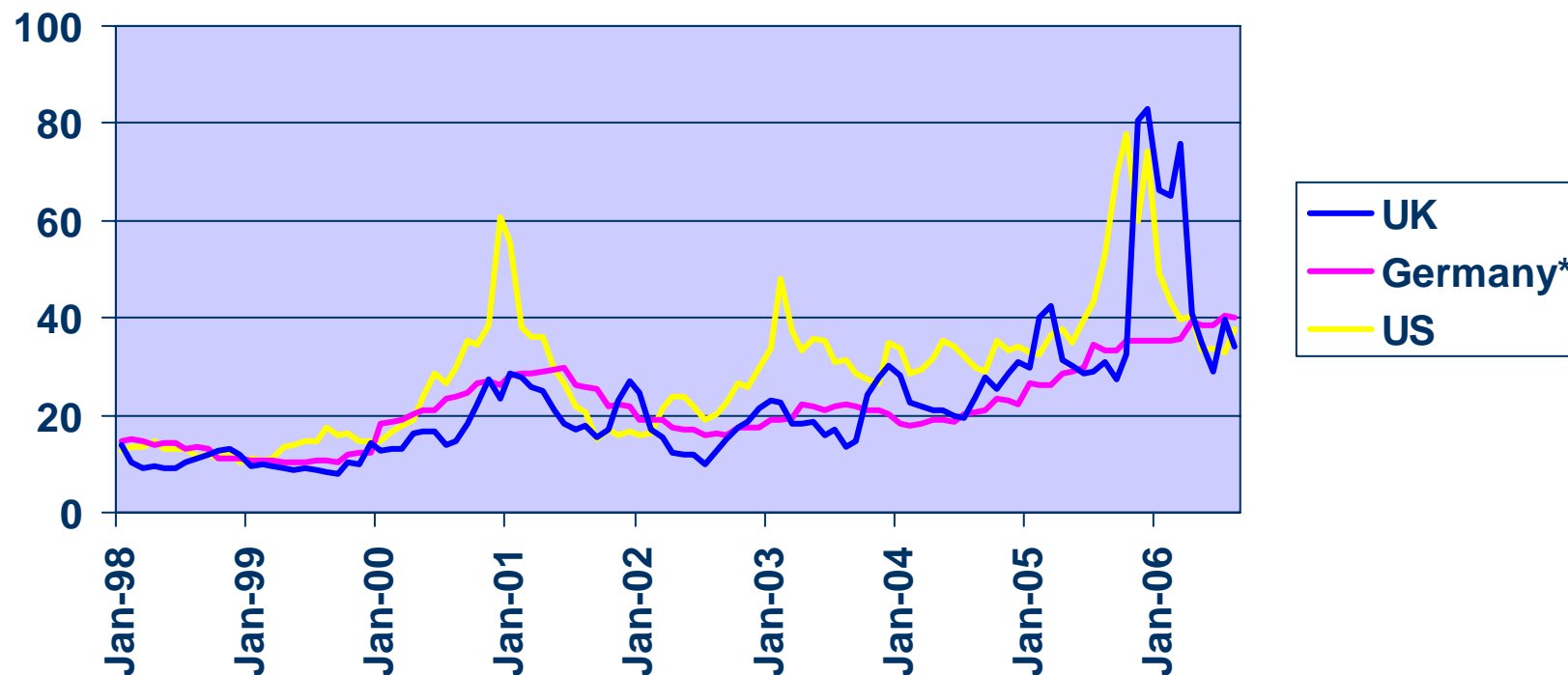


* Top 20 most volatile primary commodities in 2004-2006 (year to date) covered

Source: IMF; Heren; DTI analysis

And during winter, UK wholesale gas traded at a premium to other markets

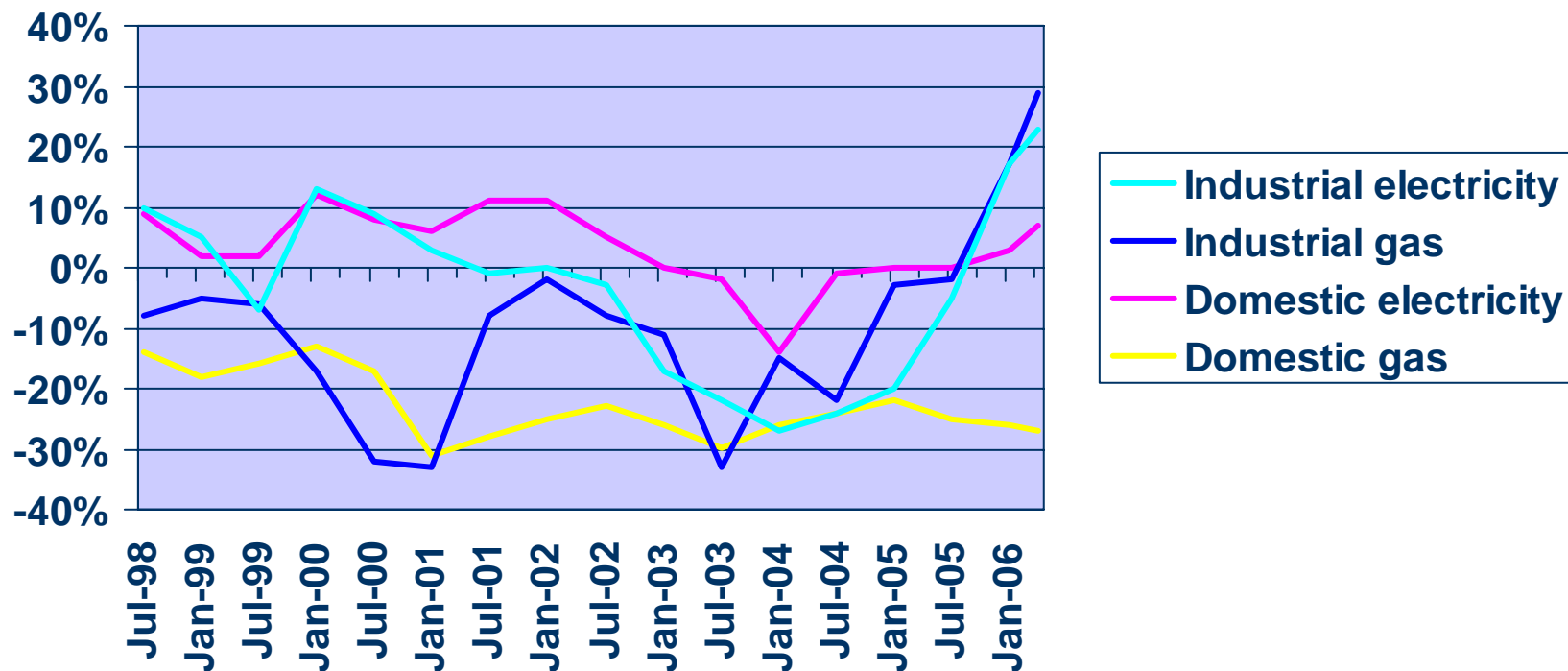
Monthly average wholesale gas prices in the UK, US and Germany*
p/therm



*Russian gas at German border used as a proxy for German wholesale gas prices
Source: Heren

For the first time in years, energy prices to industry have risen above EU average

UK end-user* energy prices relative to EU median
% discount/premium

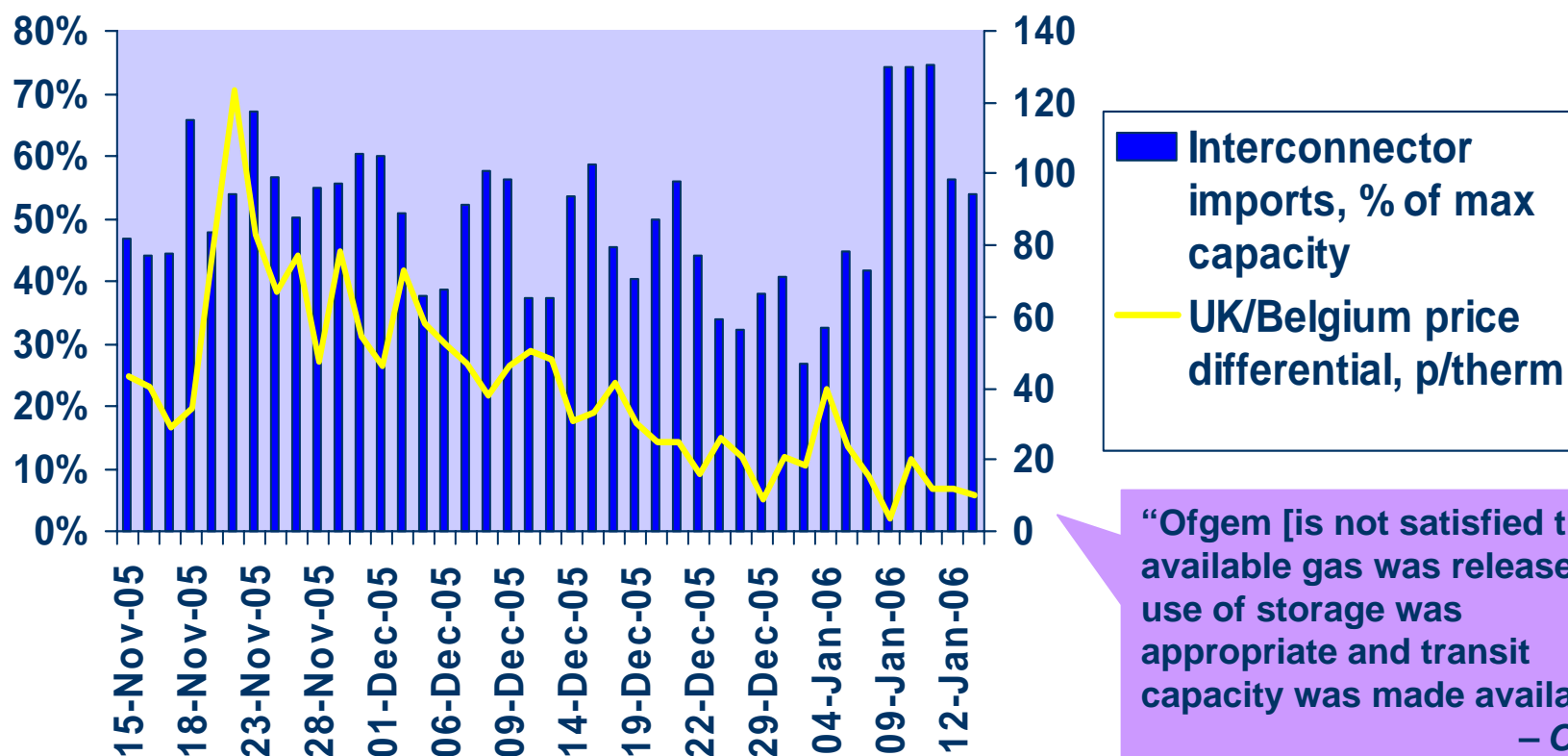


* For medium sized industrial customers excluding taxes

Source: DTI statistics; DTI analysis

Lack of transparency in EU gas markets has created price uncertainty...

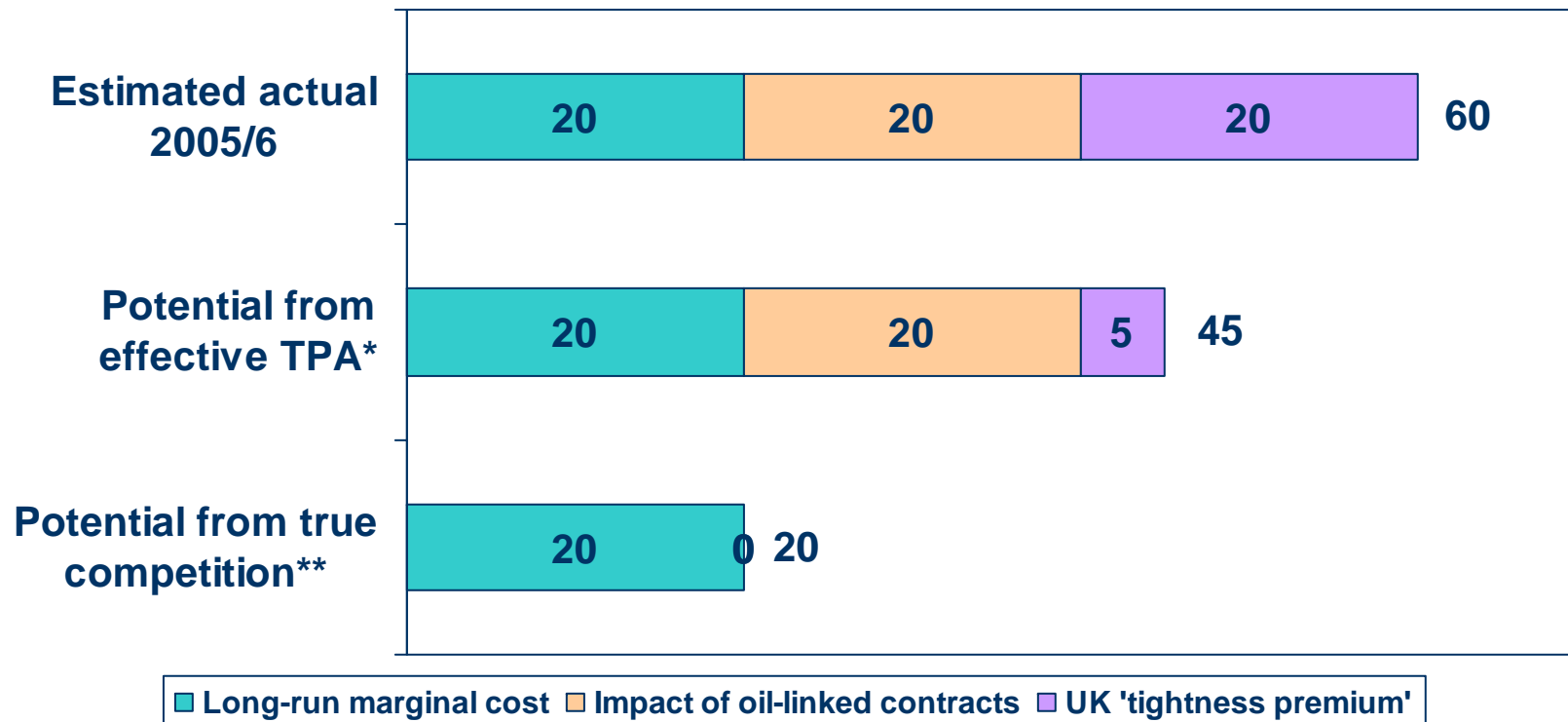
Imports and gas price differentials winter 2005/6
Percent, p/therm



“Ofgem [is not satisfied that] available gas was released, use of storage was appropriate and transit capacity was made available”
– Ofgem

And lack of EU competition may be a cause of 'unnecessarily' high gas prices

Illustrative winter 2005/6 gas price scenarios p/therm

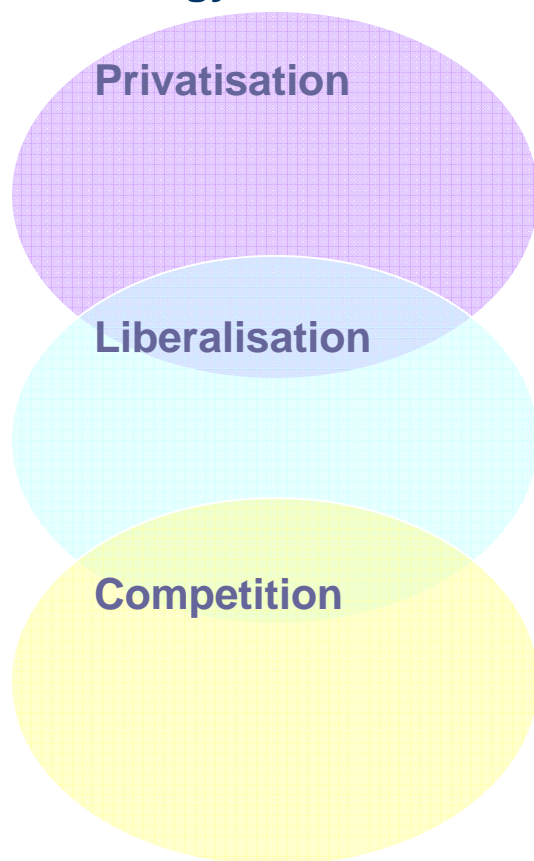


* Assumes Interconnector would have imported fully through the winter; ** Assumes EU-wide mid-stream and downstream competition forces (and allows) producers to sell and utilities to buy at cost-reflective prices

Source: Heren; NG; DTI statistics; DTI analysis

But reaching 'full competition' in EU will continue to be a regulatory challenge

Drivers of effective energy markets



Examples of levers

- Disposal of Government / municipality stakes and 'golden shares'
- Open access to resources
- (Simple) third-party access
- (Ownership) unbundling
- (Information) transparency
- Independent regulation
- No anti-competitive behaviour / contracts
- Limited producer market-power upstream
- Competition authorities 'with teeth'
- Sufficient cross-border capacity

Desired outcomes

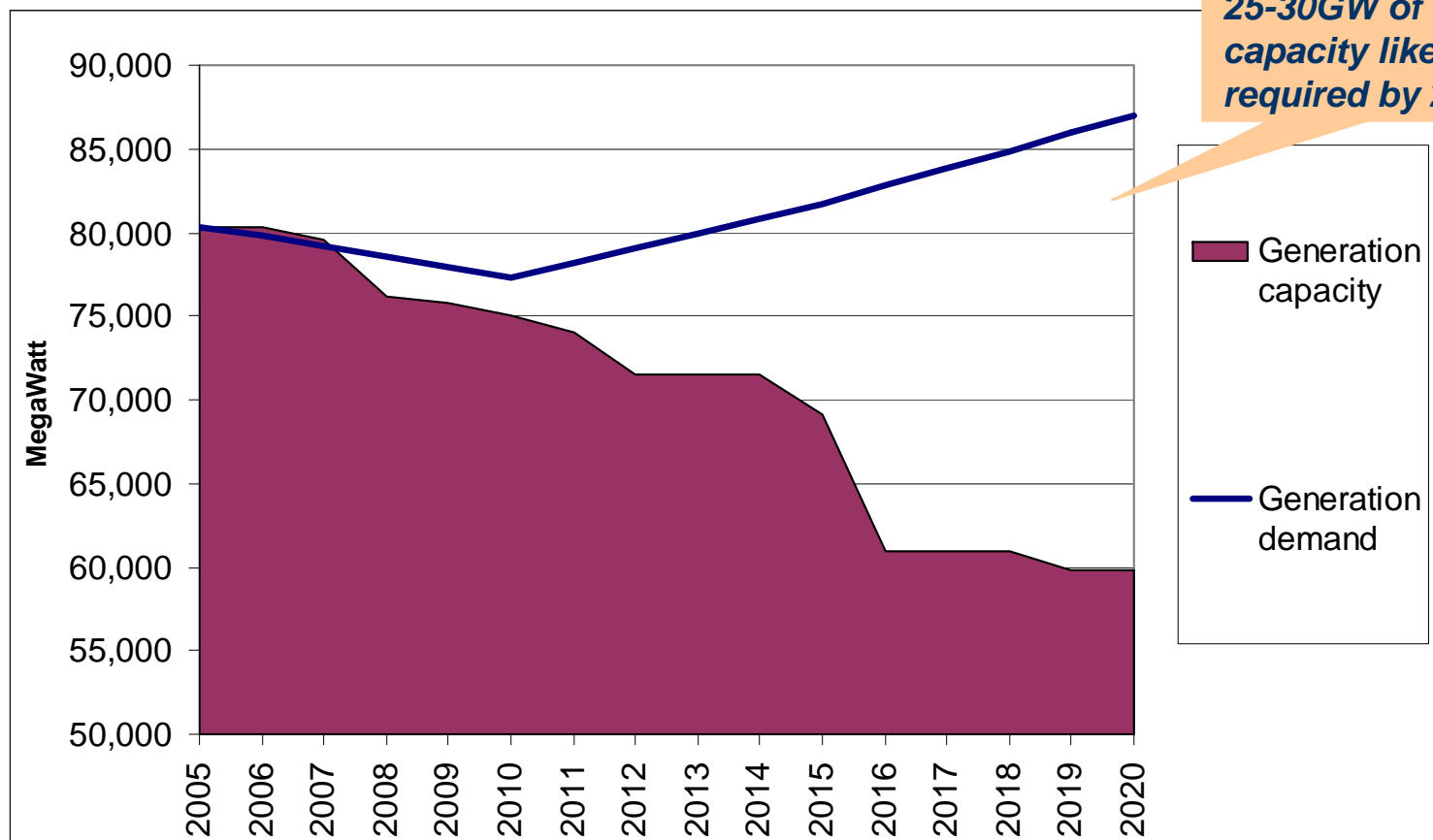
- Companies acting to maximise profits (still subject to public service obligations)
- Lower entry/exit barriers
- More efficient price-formation
- Lower costs
- Lower margins
- More cost-reflective prices

Source: Energy Markets Limited; DTI

In the medium term, the electricity market will require significant new investment

Estimated power generation capacity requirement* to 2020

MW



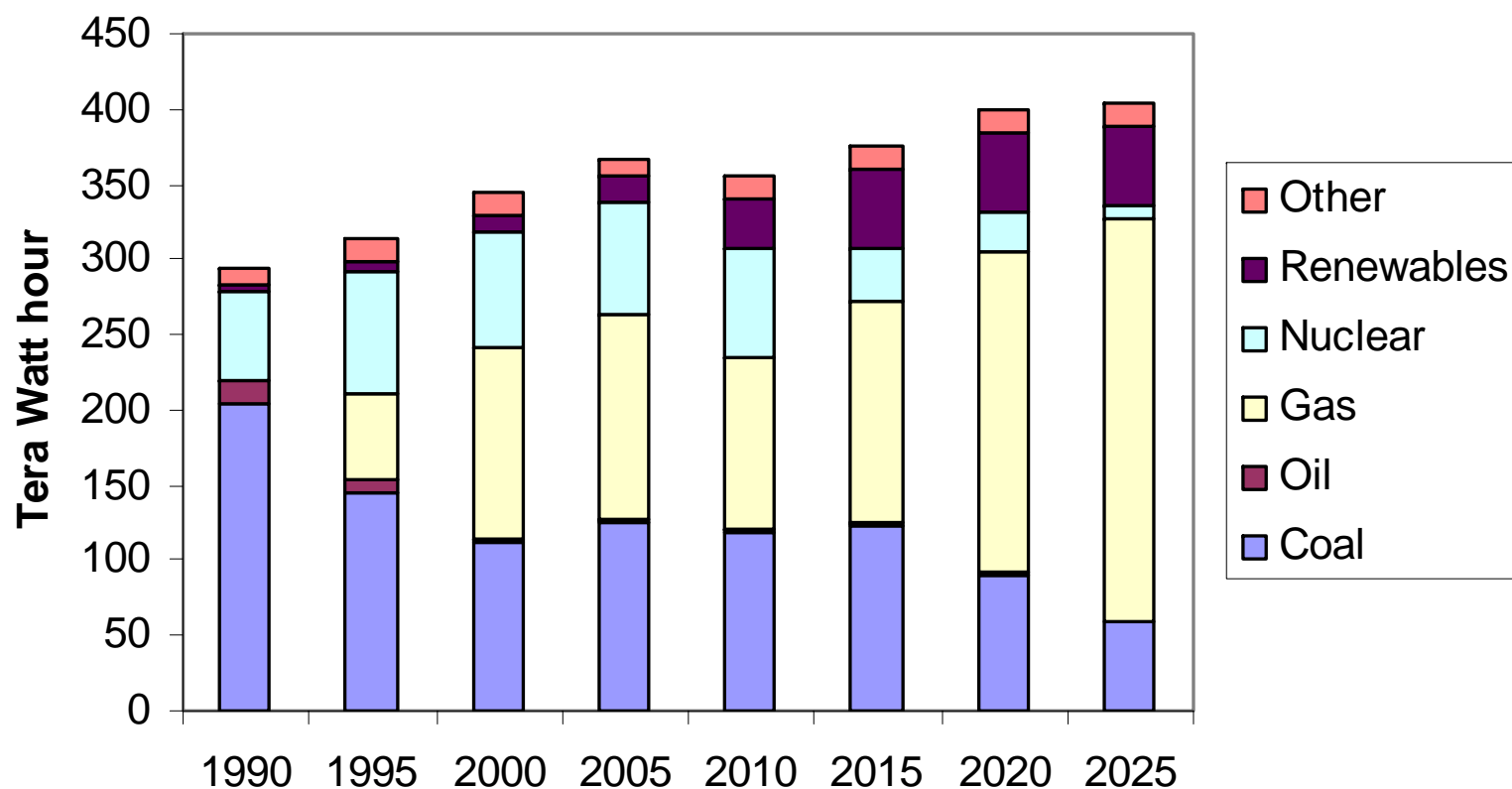
25-30GW of new capacity likely required by 2020-25

* Assuming an illustrative peak capacity margin of 20%
Source: NG; DTI analysis

The resulting fuel mix may end up being dominated by gas-fired capacity

A generation mix scenario to 2020

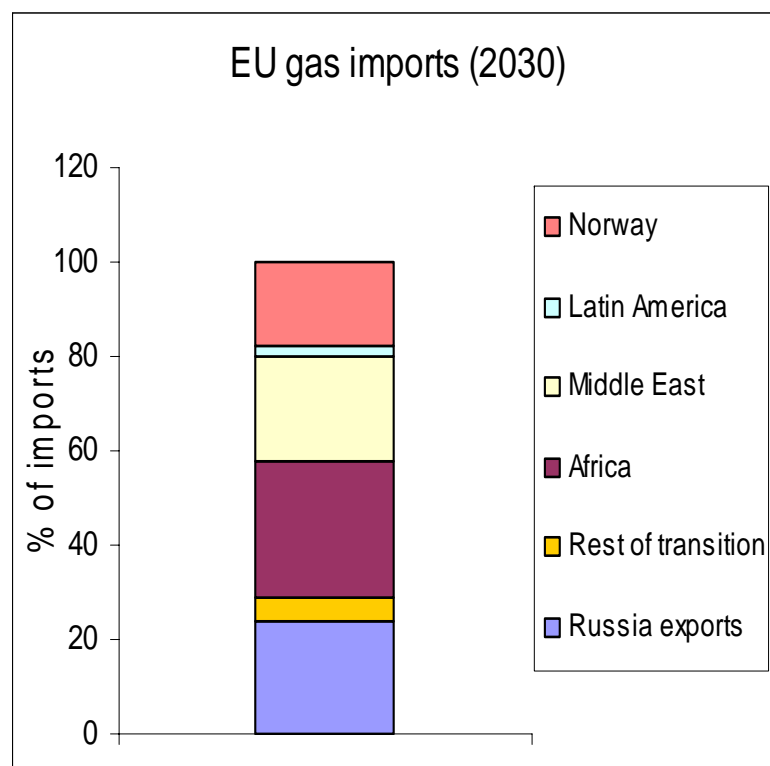
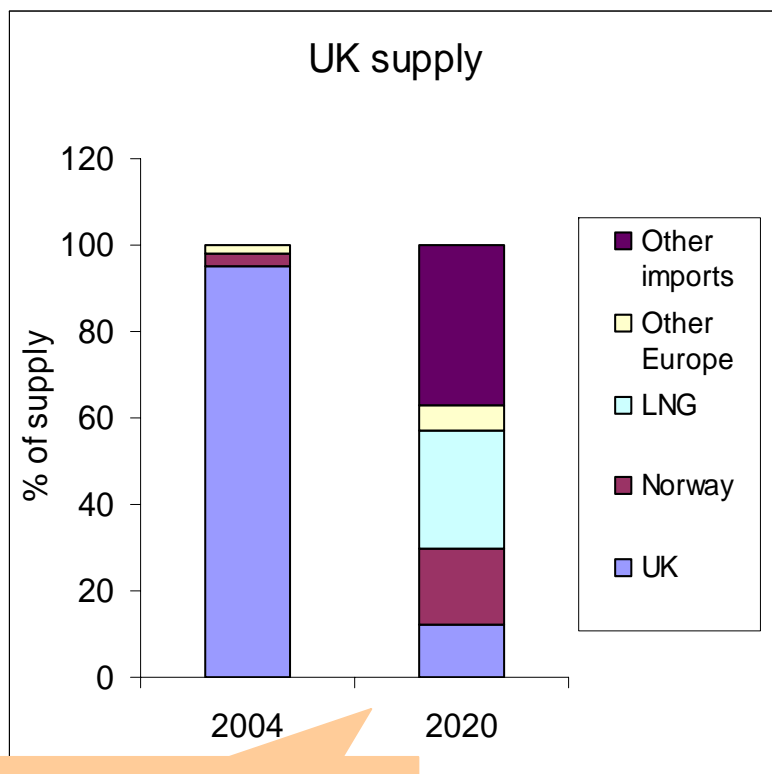
TWh



Source: DTI analysis

And our gas import requirements will need to be delivered from further afield

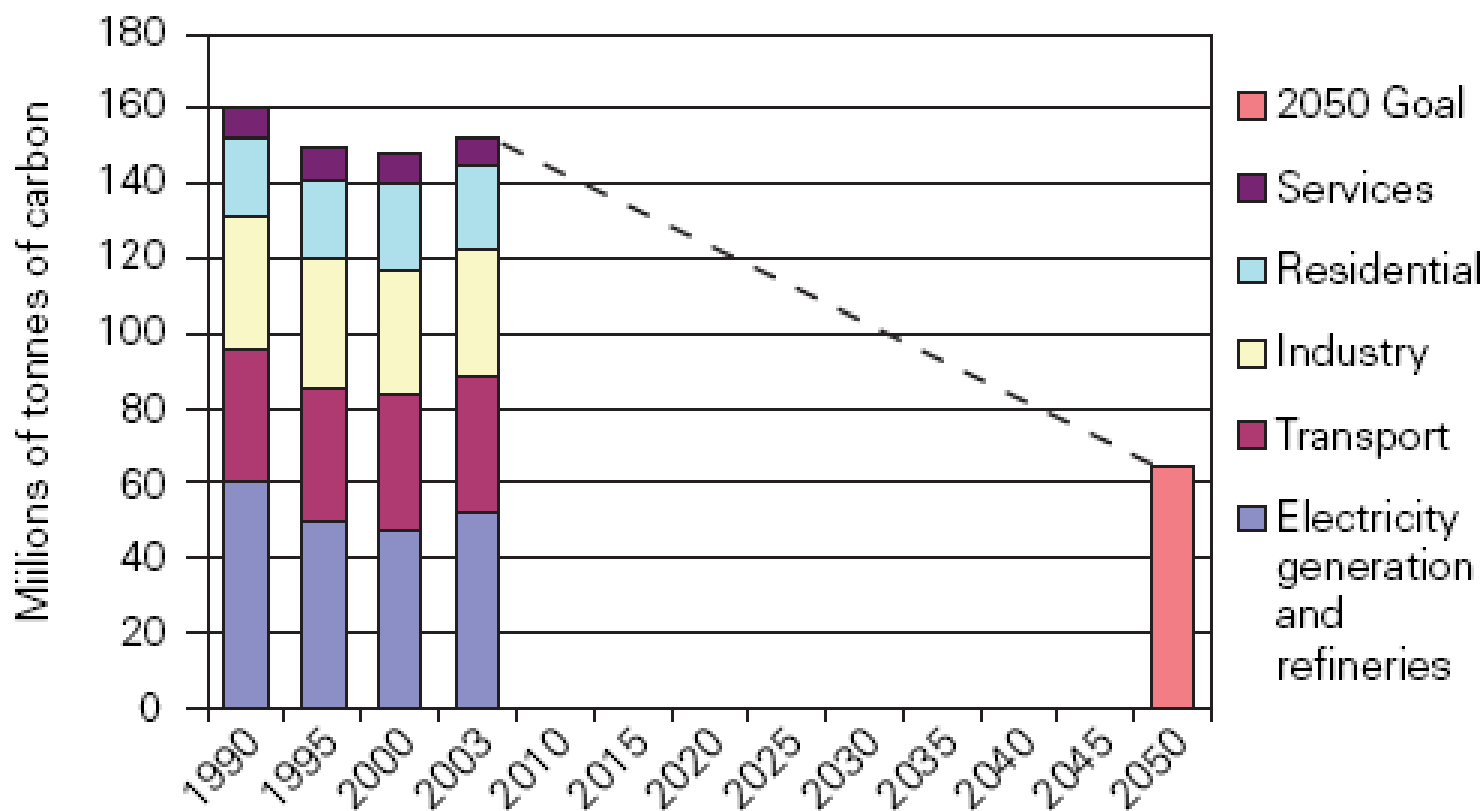
Sources of UK gas and EU gas imports to 2020/2030 Percent



In addition to imports, new storage capacity will also be required

Finally, meeting the CO₂ goal will require further measures and action in all sectors

Carbon emissions by sector and the 2050 goal



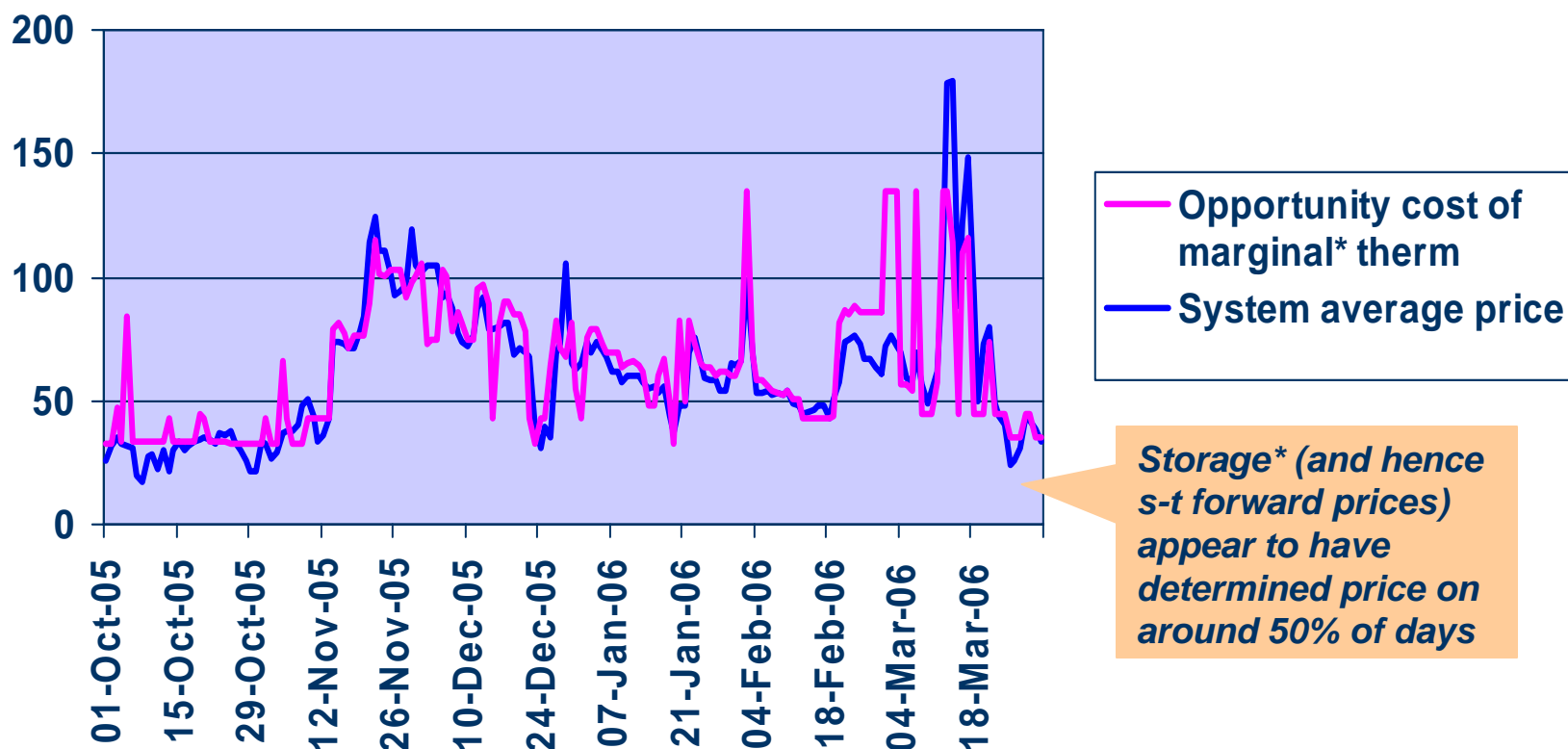
Source: DTI

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Day-to-day gas prices last winter broadly corresponded to the marginal cost of gas

Daily system average and modelled* UK gas wholesale prices
p/therm



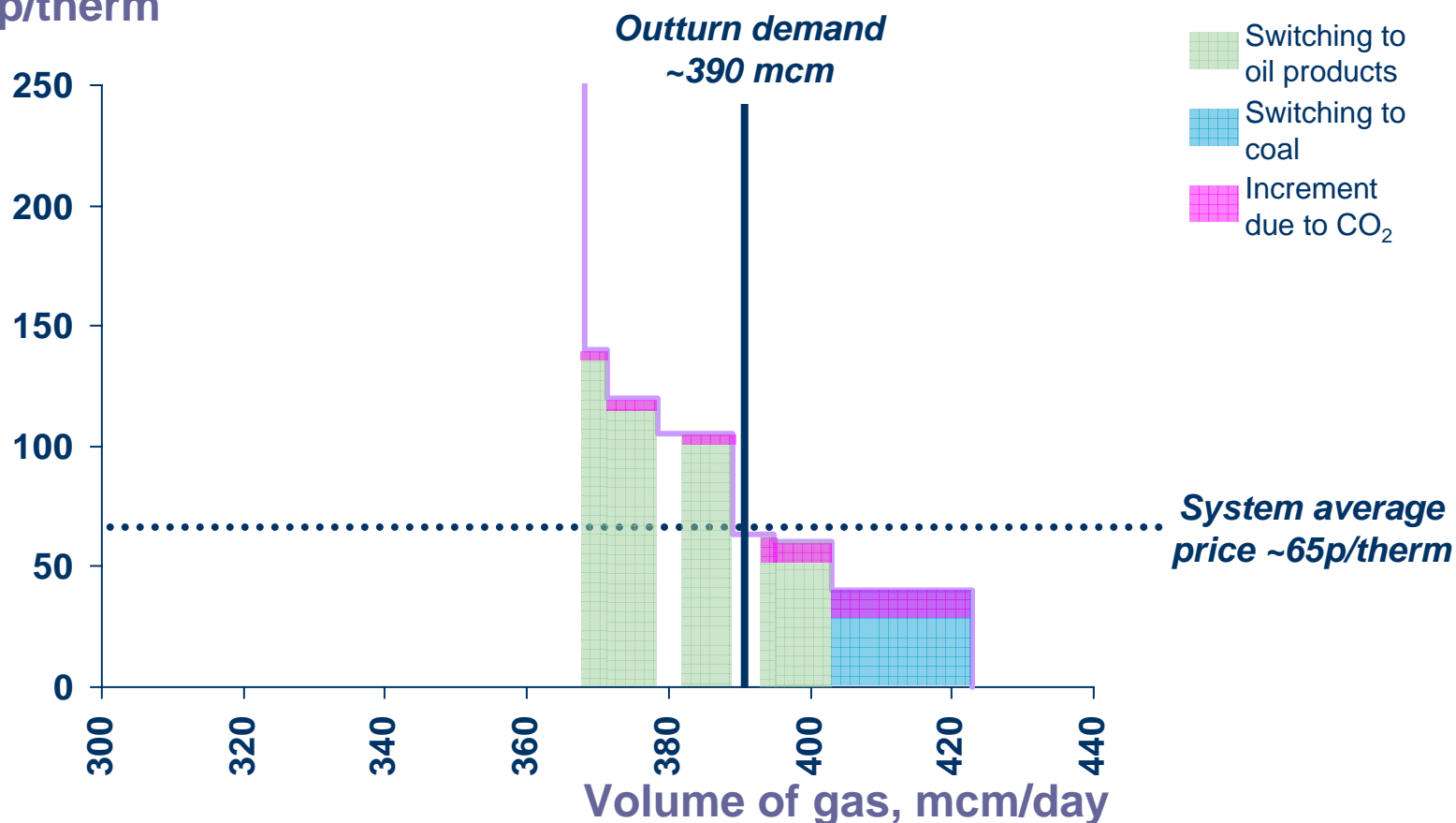
*Model based on marginal source of gas and its opportunity cost; volumes less than 5 mcm/day have assumed to be price taking, not price setting, in any particular day

Source: Heren; NG; DTI analysis

Gas prices appear to have worked to 'optimise' use of the scarce resource

Illustrative partial demand curve* for UK gas on 30 January 2006

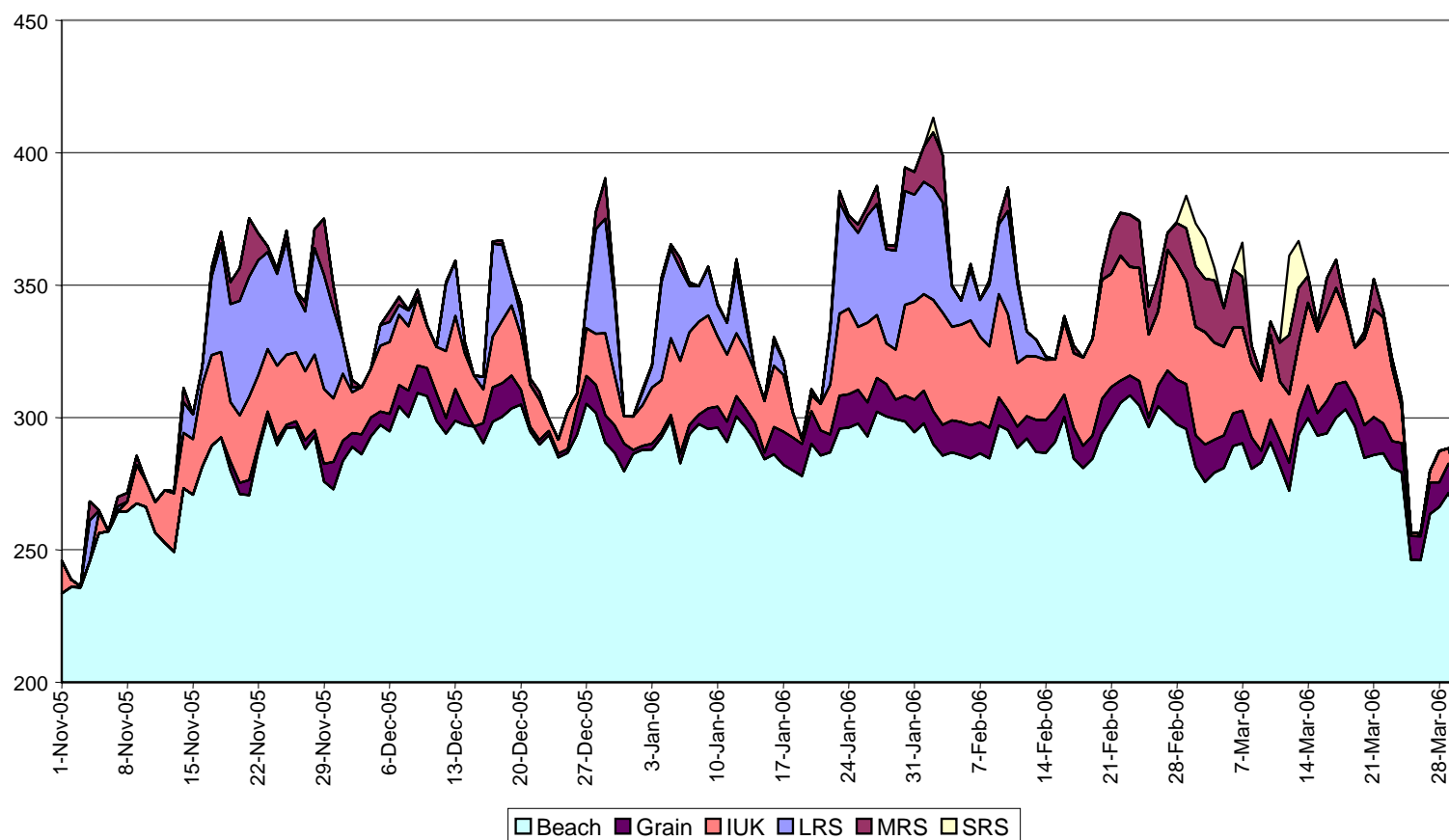
p/therm



* Prices different gas user segments were likely to be 'willing to pay', given their next best alternative; non-energy-intensive I&C, domestic customers and residual power generation assumed to be price inelastic
 Source: Global Insight; NG; DTI analysis

And towards the end of the winter, many sources of supply delivered more gas

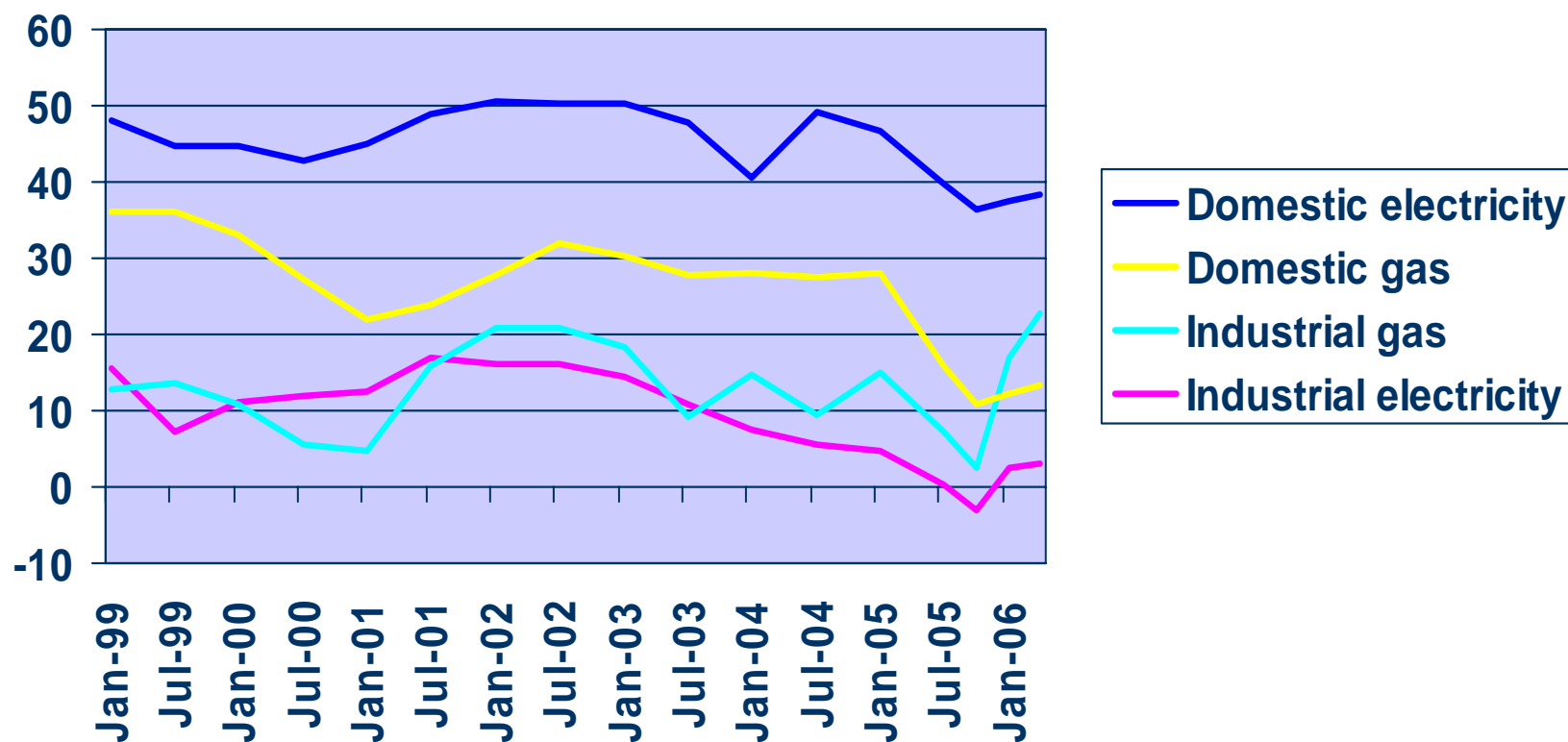
Daily demand and sources of supply in the UK gas market in winter 2005/6
Mcm/day



Source: NG

Retail price increases to end-users have tended to lag rises in wholesale prices

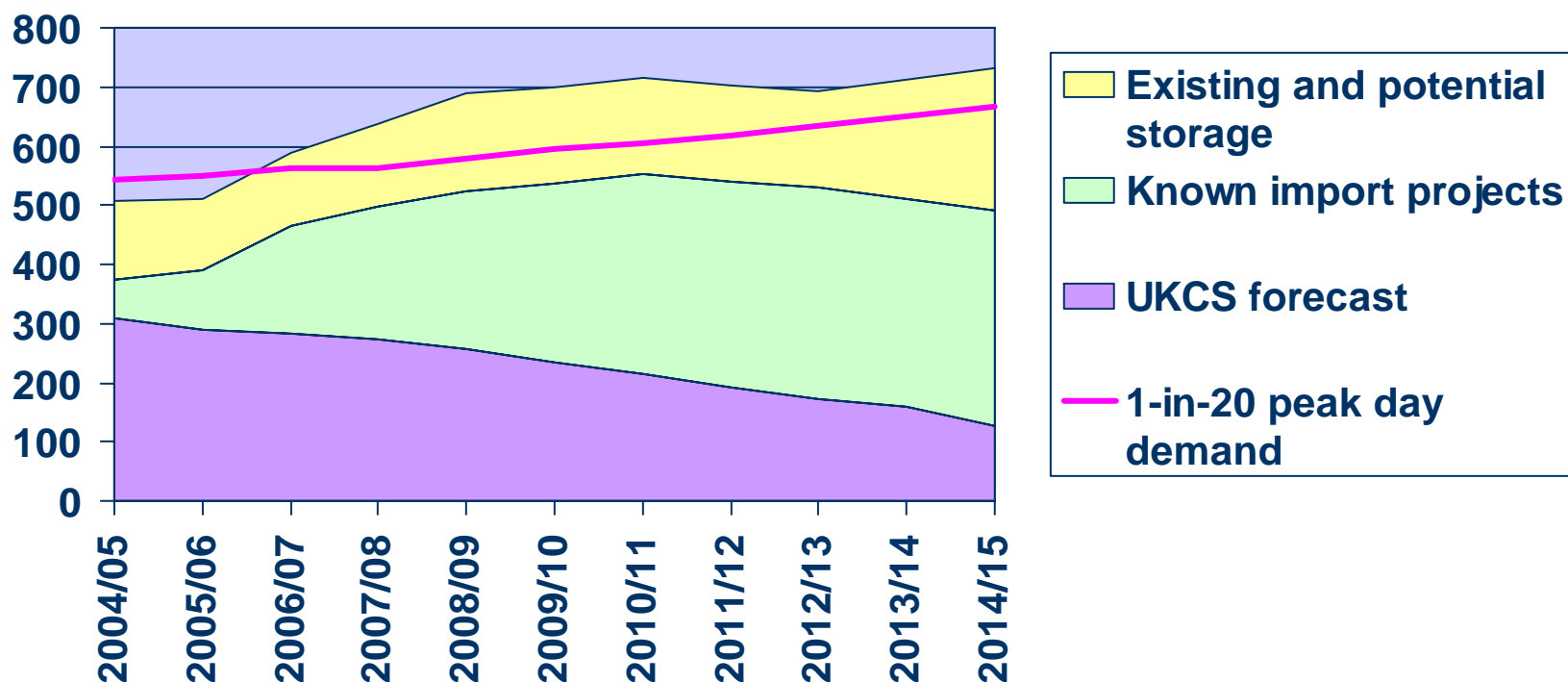
Absolute difference between retail and wholesale price*
p/therm (gas), £/MWh (electricity)



* 12-month rolling average spot prices used as a proxy for underlying wholesale opportunity costs
Source: Heren; Platts; DTI; DTI analysis

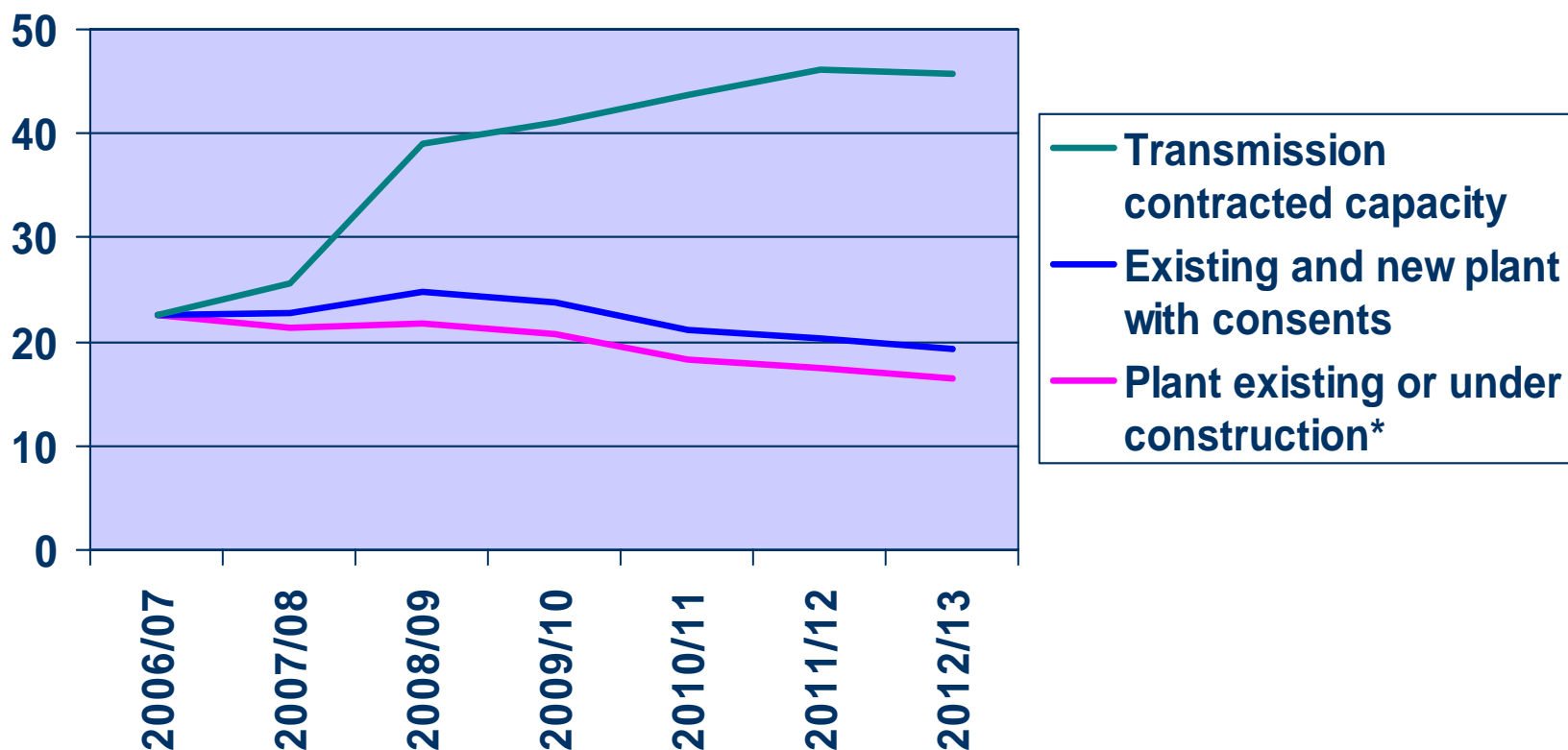
Looking forward, the sector is responding with significant new investment planned

UK gas market peak day demand and supply capacity Mcm/day



Companies are also creating options to fill the 'generation gap' with new capacity

UK generation plant reserve margin projections
Percent

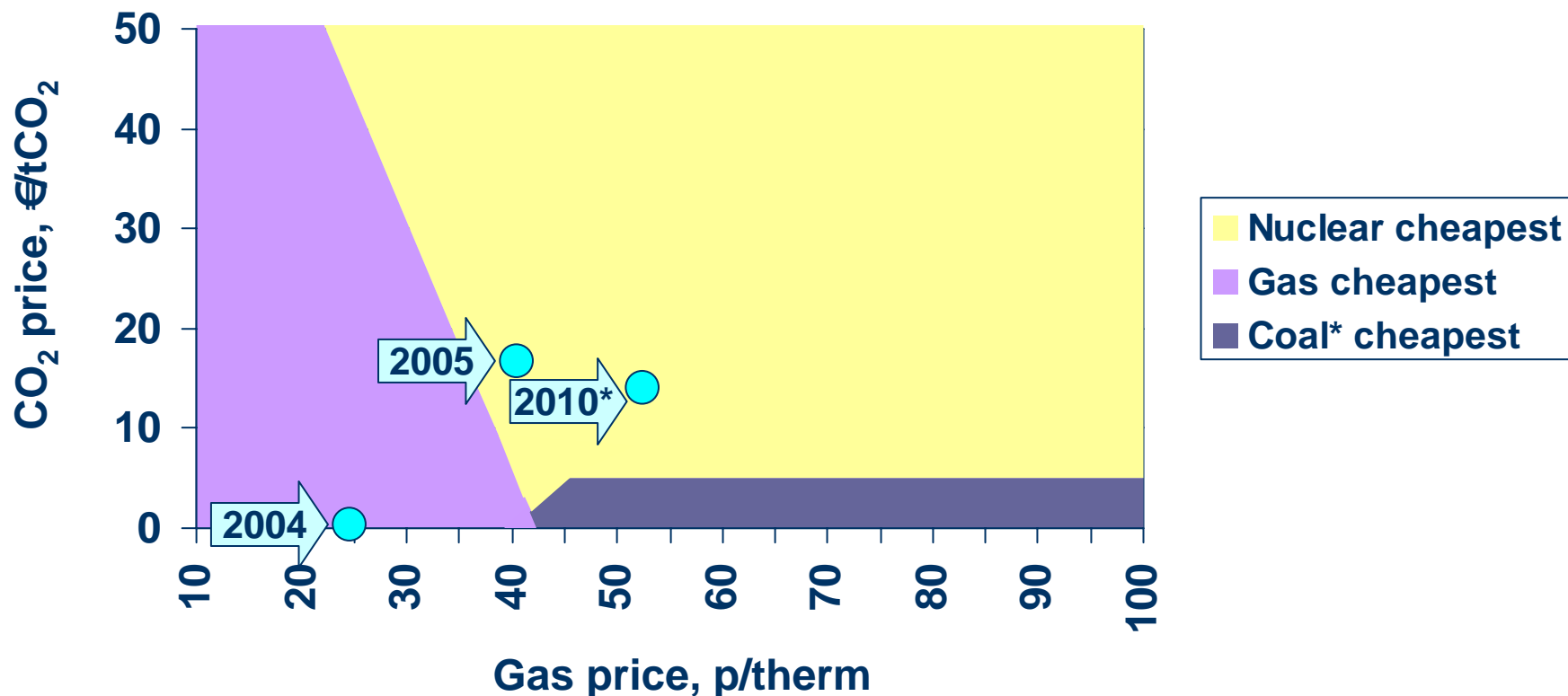


* Takes into account announced nuclear shutdowns but no other plant closures

Source: NGT Great Britain Seven Year Statement 2006

And there should be a market incentive to ensure sufficient diversity in fuel mix

Cost parity of new coal- and gas- and nuclear-fired generation
 p/therm, €/tCO₂



* Forward price on 14 June 2006; assumes coal price of \$55/tonne; coal with CCS has not been analysed
 Source: Chatham House; Heren; Point Carbon; DTI

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In the short term, the Government is facilitating effectively functioning markets

- **Dialogue with market participants to maximise available gas supplies to the UK (beach, I/C, LNG and storage)**
- **Dialogue with industry and Ofgem to facilitate demand-side response (e.g., environmental limits in 2005/6)**
- **Continued efforts on EU liberalisation and transparency, and support for Ofgem/EU investigation**
- **Facilitation of timely delivery of major new import and storage infrastructure where appropriate**
- **Review of legislation/regulation for gas storage and supply infrastructure (including off-shore salt caverns and LNG)**
- **Improving the operation of the market (e.g., more information, use it or lose it conditions)**

The Energy Review is addressing the longer-term policy challenges

- **Continued commitment to international CO₂ reduction and to strengthening the EU ETS**
- **Enhanced energy efficiency (standards, better information, potential incentives, Government's own use)**
- **Lower barriers and stronger incentives for low-carbon supply (RO, distributed energy, nuclear, biofuels, CCS)**
- **Forward-looking information on security of supply and enhanced framework for investment (e.g., planning)**
- **Open, transparent, well-functioning international fuel markets and contingency arrangements**

The next steps are to refine and implement the Energy Review outcomes

- **Consultations, including:**
 - **Energy saving on households**
 - **Emissions reductions from commercial and public sectors**
 - **Changes to the Renewables Obligation**
 - **Planning for household microgeneration**
 - **Policy framework for nuclear new build**
 - **Planning (gas, large scale electricity)**
 - **Gas security of supply**
- **Distributed Generation: Foresight and HMG/OFGEM studies**
- **Coal Forum**
- **Energy White Paper around turn of year**