UK Gas Supply and Demand Changes and the Effects on the National Transmission System

UKOPA, 25th February 2009

UKOPA/09/0015

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Agenda

Overview of the National Transmission System (NTS)

- Existing Infrastructure
- Recent and current operating regime

The links between Electricity and Gas

- Environmental challenges
- Impact of the 2008 Planning Act
- Maintaining Security of Supply

Forecast changes to NTS operation

- Changing dynamic of the NTS

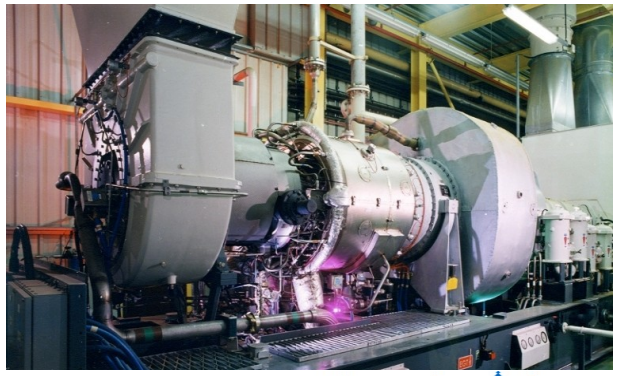
Overview of the National Transmission System (NTS)

Large diameter high pressure steel pipelines

- 7,383 Km
- 150 mm to 1220 mm diameter
- 400 plus Above Ground Installations/offtakes
- 40 <= 94 barg
- Annual throughput ≈ 100 Billion m^3

Compressors and Terminals

- 26 Compressor Stations, using aero derivative jet engines and electrical motors
- 9 Terminals



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General operation of the NTS (2000 to 2005)

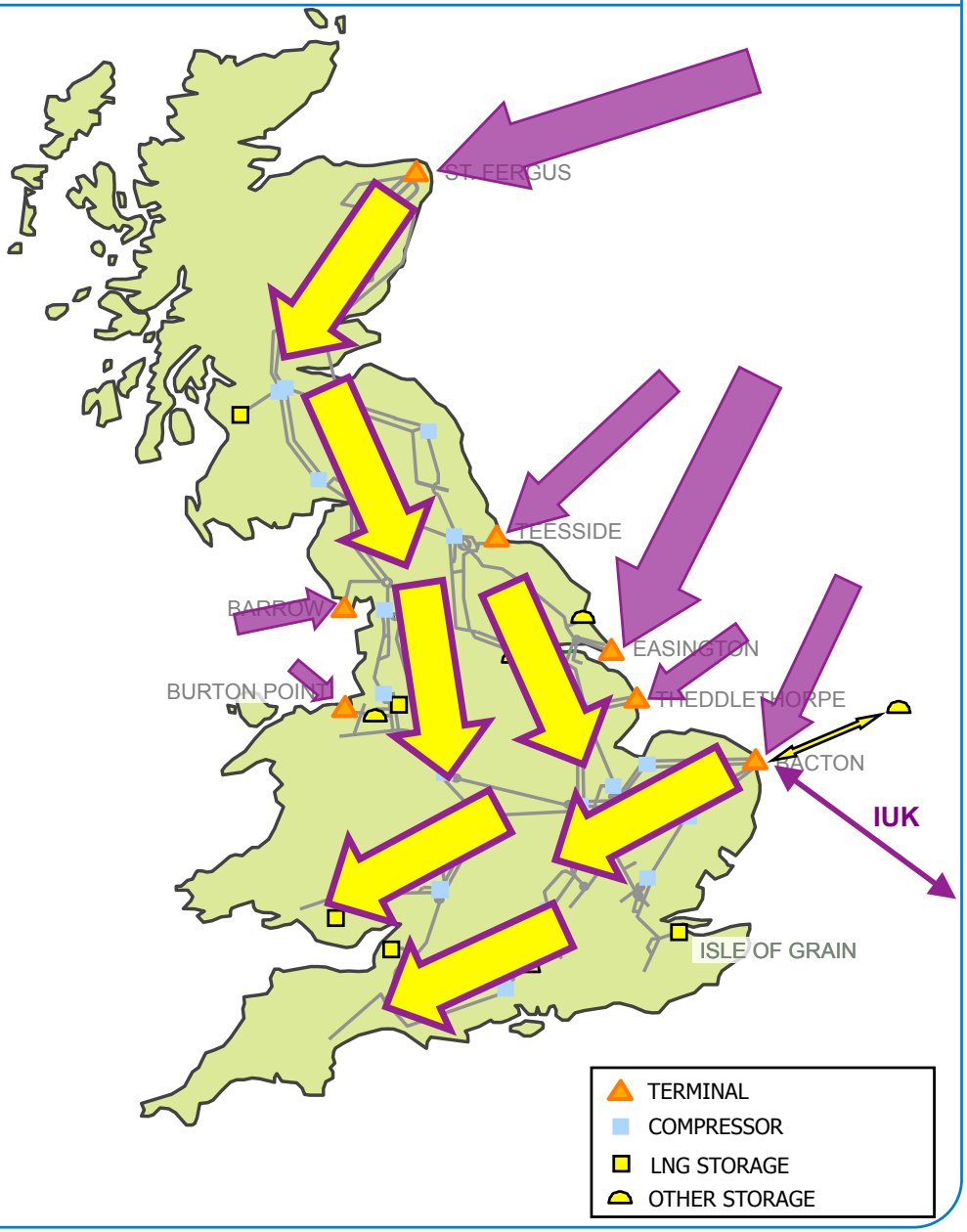
Majority of gas from the UKCS entering the UK from Entry Points in the North and East of the UK

Strategically located Compressor Stations pushing gas North to South and East to West

LNG Liquefaction plants used to support extremities

Limited Storage

UK a net exporter of Gas



Change Agents for Gas Supply and Demand

Imported gas

- To overcome UKCS decline

Market Responsive supplies

- Storage
- Contractual flexibility for supplies

Electricity Generation

- Replace Nuclear
- Replace Coal

Flexible Electricity Generation

- Complements operation of Renewable generation

Environmental targets

- Reduction in Greenhouse Gas (GHG) emissions

NTS Development since 2005

Greater import of Norwegian Gas

Increased functionality to import gas via BBL pipeline

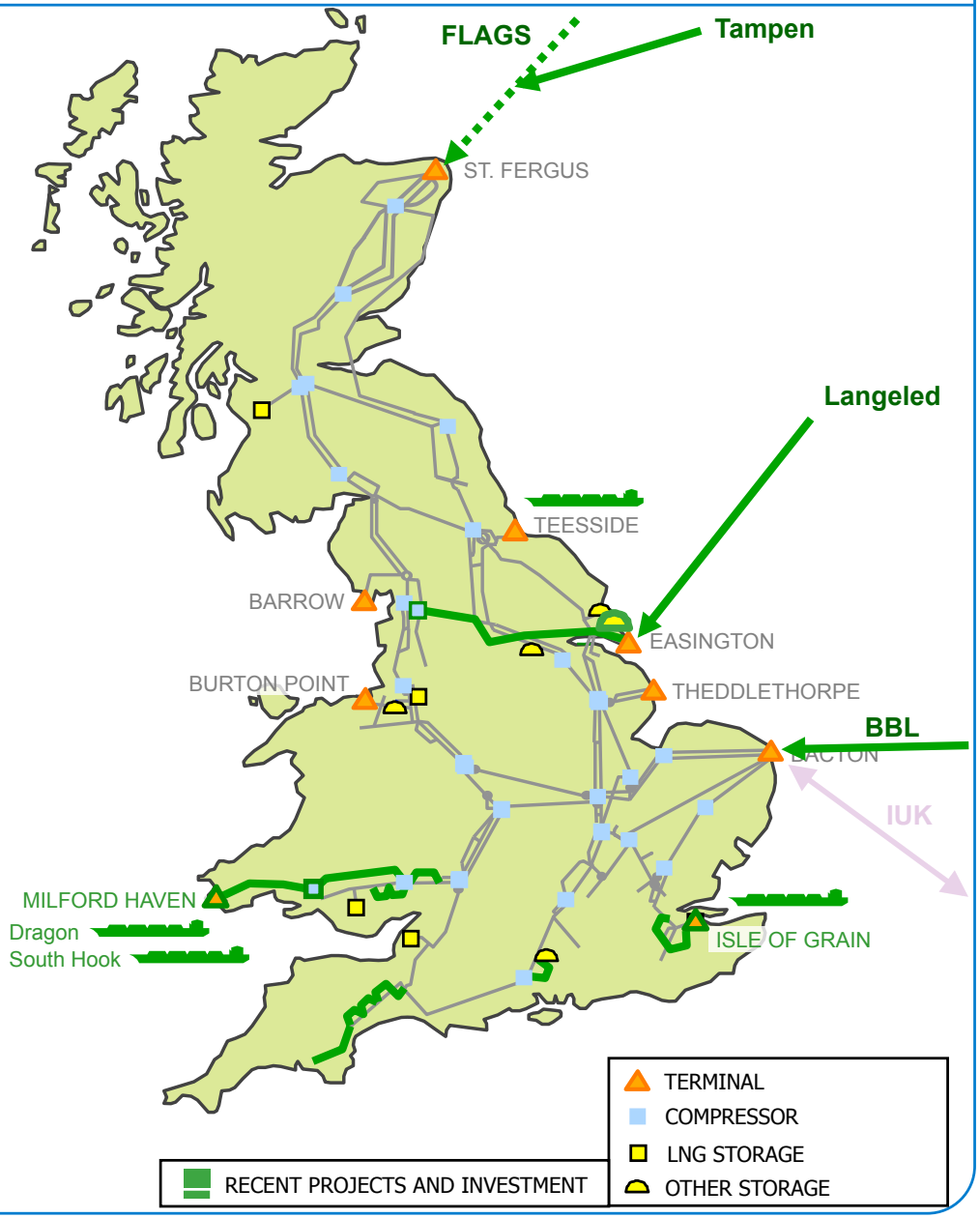
Development of LNG Terminals

Reinforcement of the network

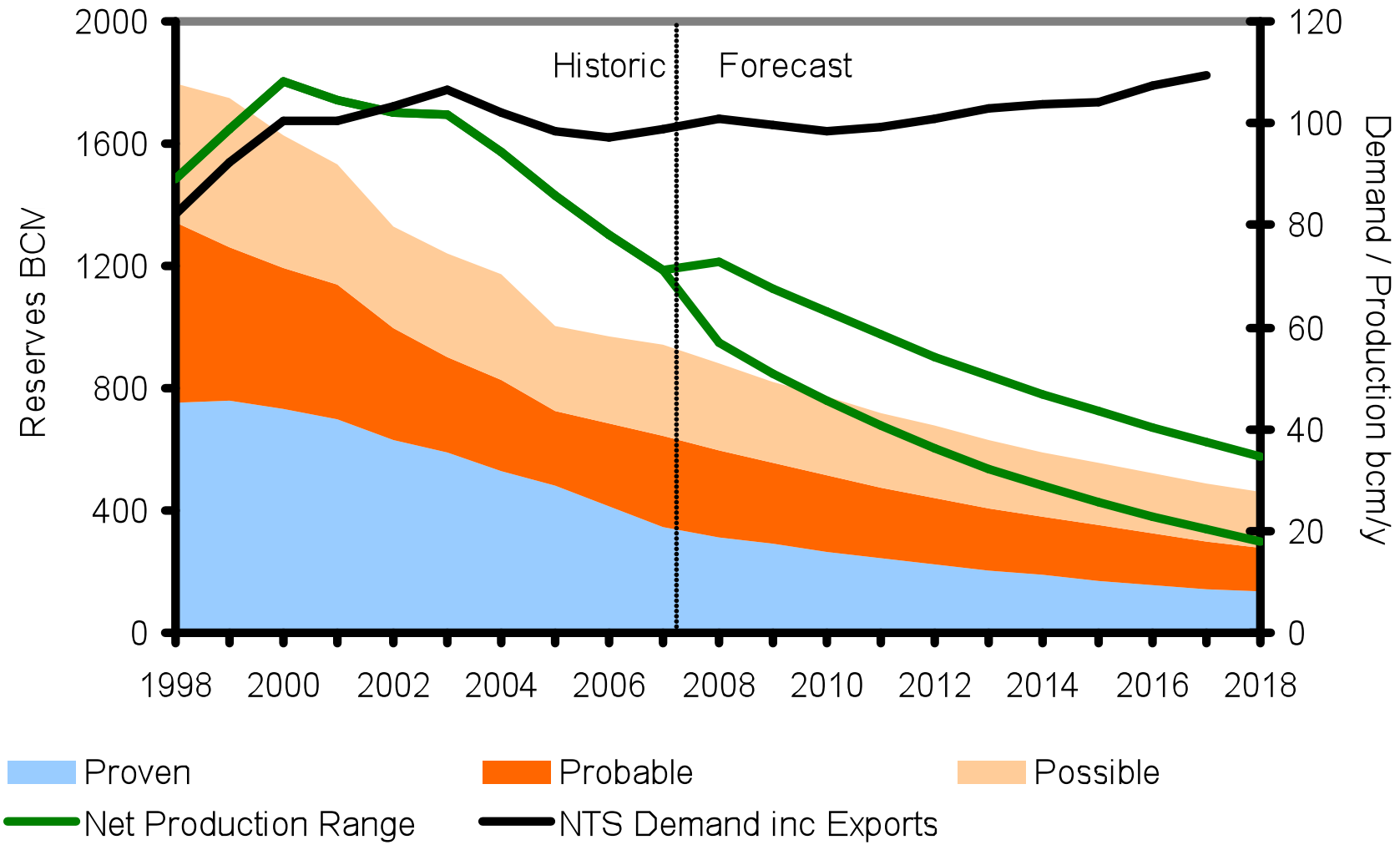
- To add greater operational flexibility and efficiency
- To accommodate new supplies
- To support increasing demand

Limited new Storage

Transition to a net importer of gas



Historic & Forecast UK remaining gas reserves, demand and net production



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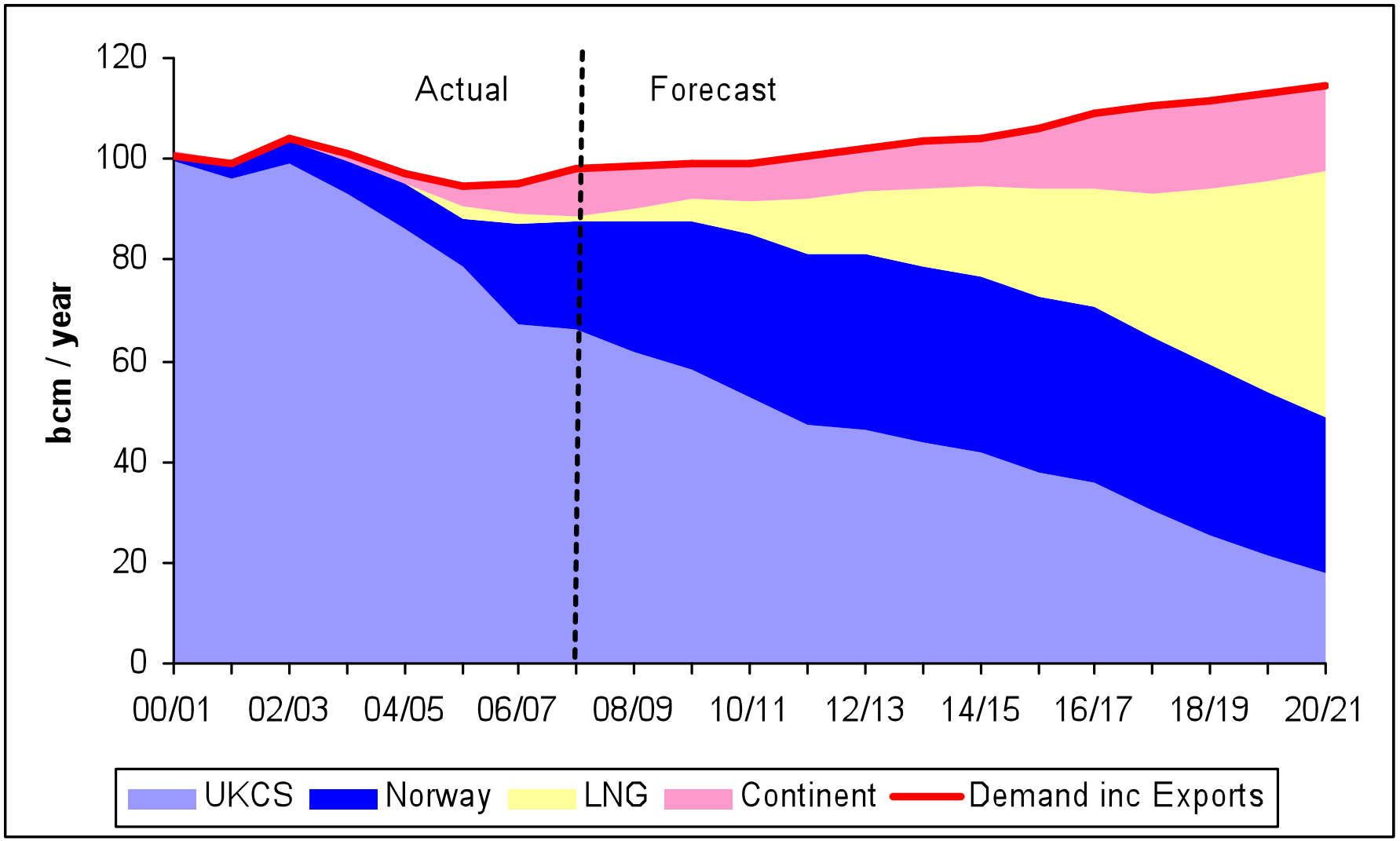
NTS Base Case Annual supply/demand match



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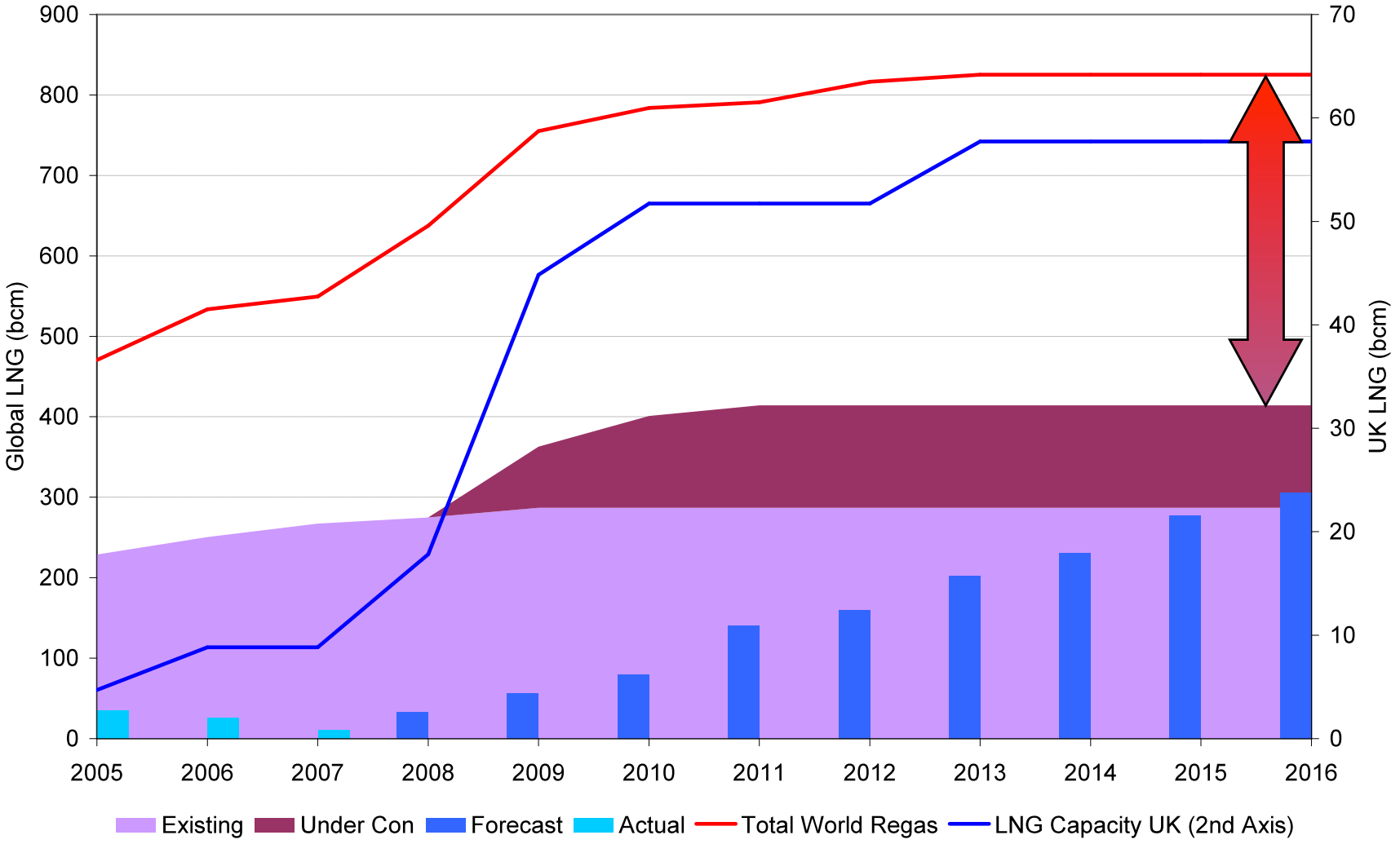
Global & UK LNG Assessment



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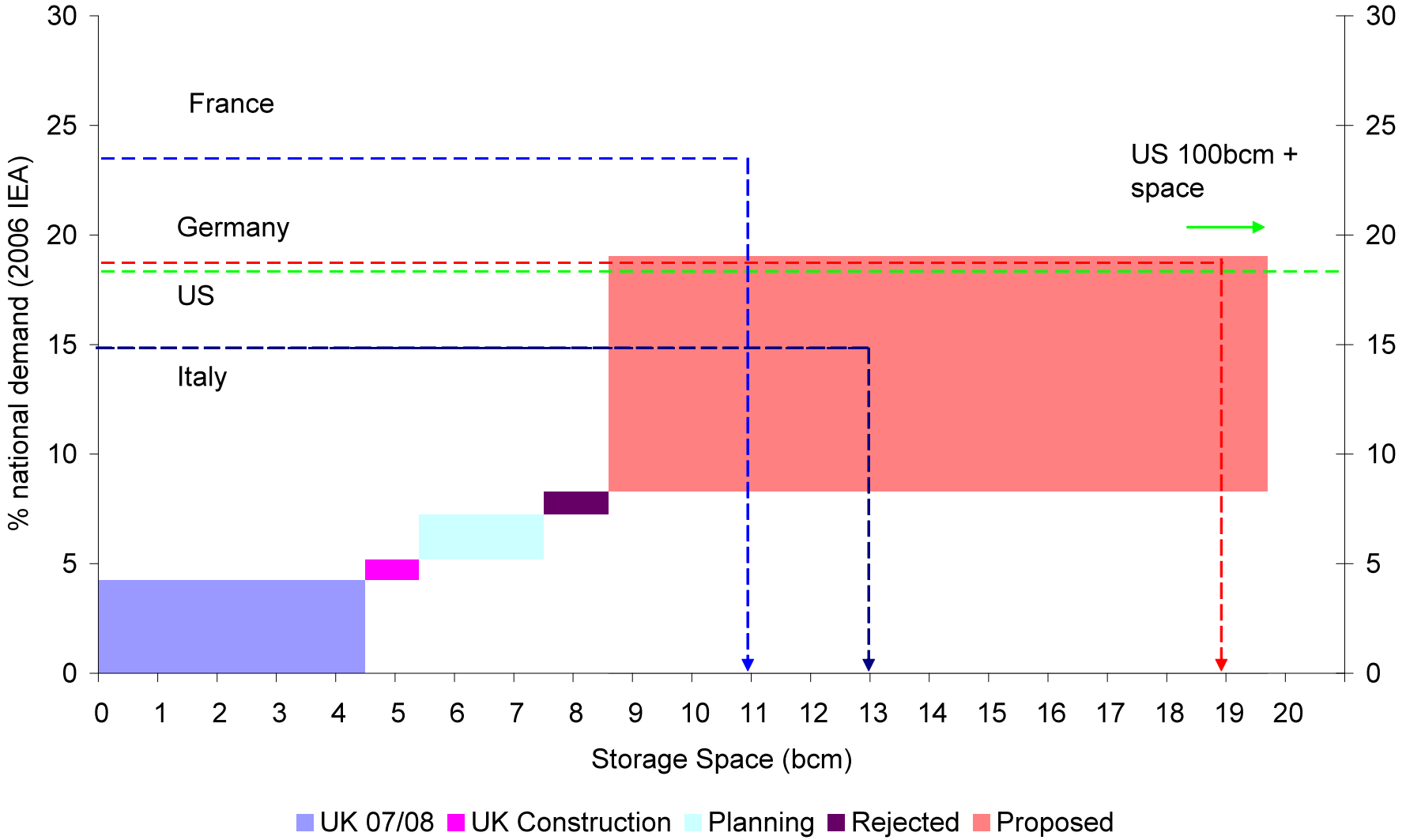
UK Storage Possibilities



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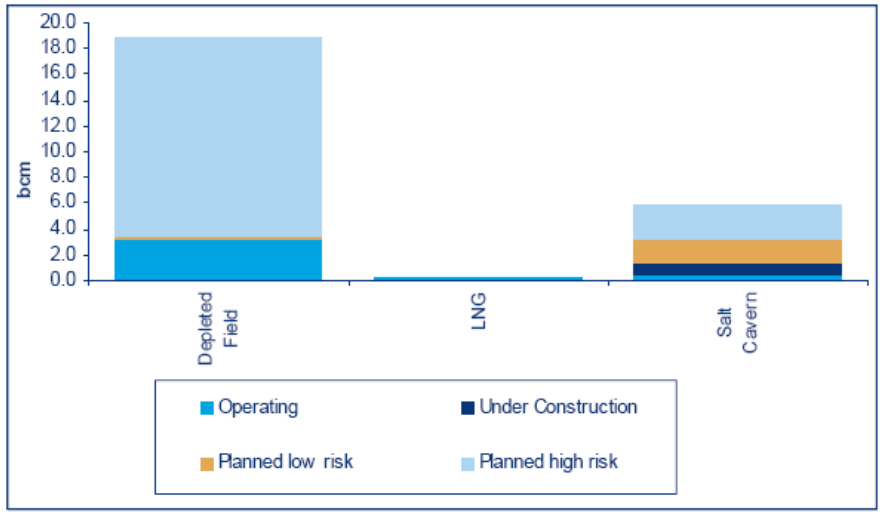
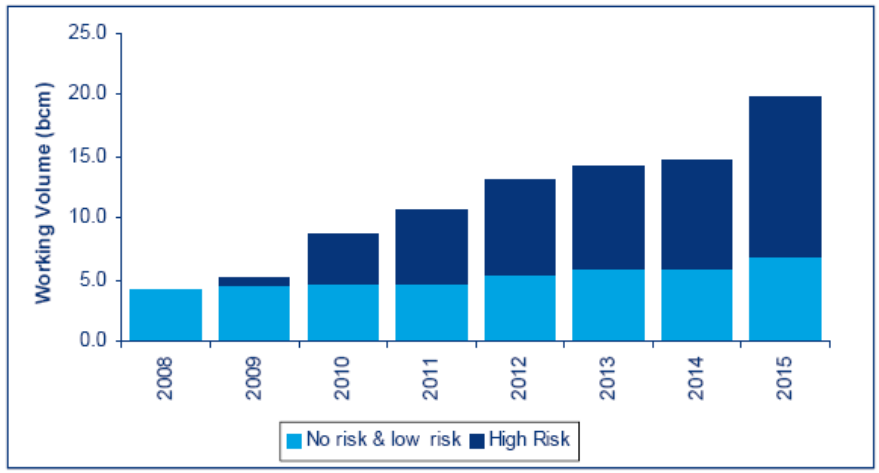
UK Storage Possibilities

UK Gas Storage by facility type to 2015



UK Gas Storage Outlook



The majority of working *volume* proposed is in depleted fields

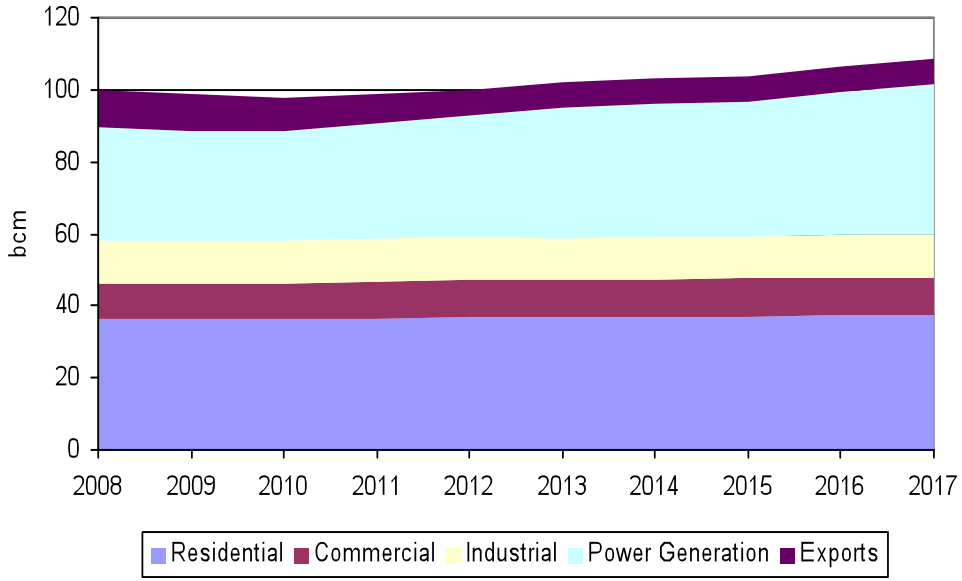
A larger *number* of Salt Caverns have been proposed, offering 5.4 bcm of working volume of which at least 2.8 bcm is likely to be available by 2015

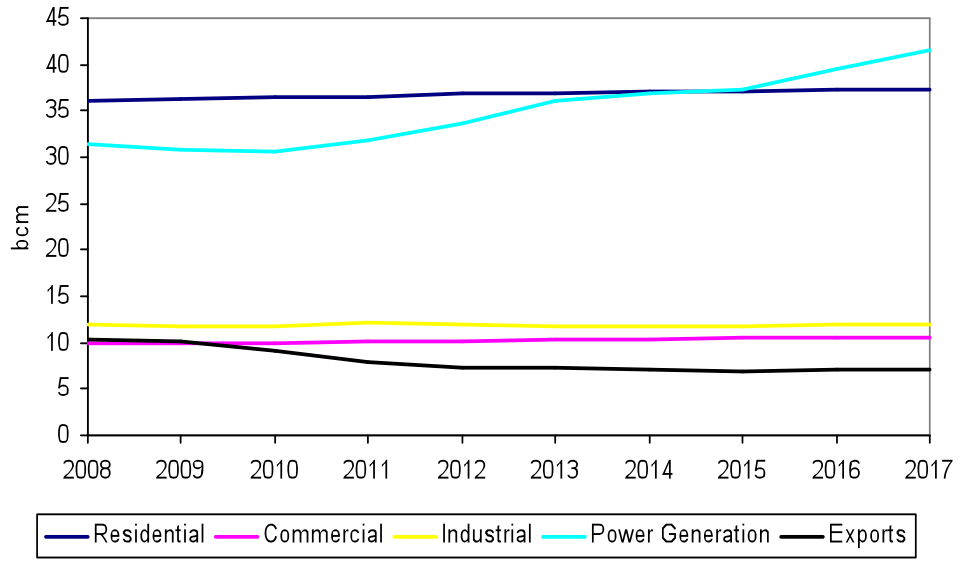
Salt Caverns provide greater deliverability which is key to replacing the loss in swing from declining gas production

Main risks to realisation of new storage projects are:

- High Capital Costs (obtaining capital)
- Gaining Planning Permission

UK Annual Demand to 2018 – Gas Market continues to grow





Market continues to grow slowly reaching 110 bcm by 2018

The power and residential sectors continue to dominate

Growth in the power sector still expected as nuclear and coal replacements can only realistically be replaced with gas in the short to medium term

Exports fall due to greater reliance on imports from continent

Other market sectors reasonably flat

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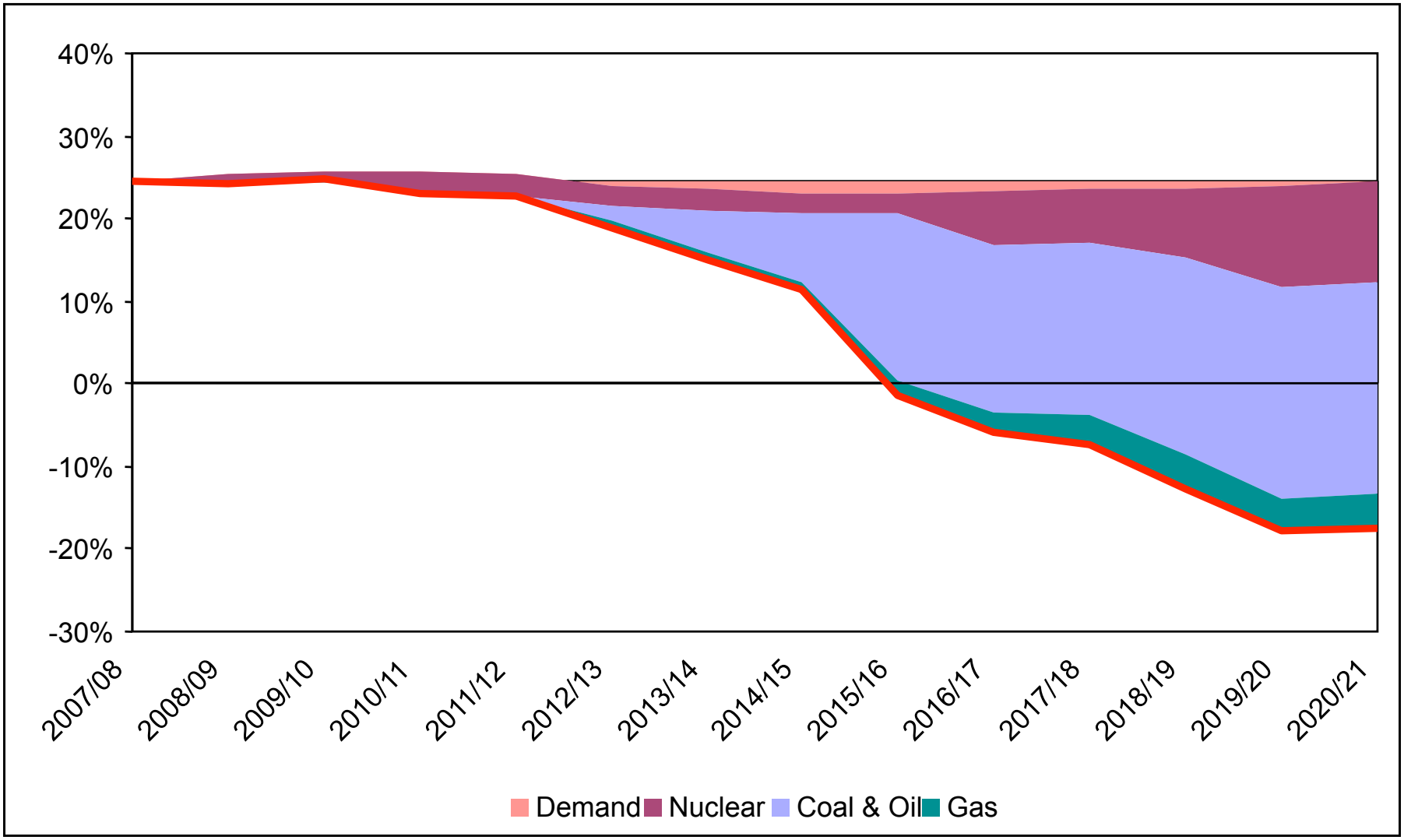
Impact of Generation Plant Closures on the Margin



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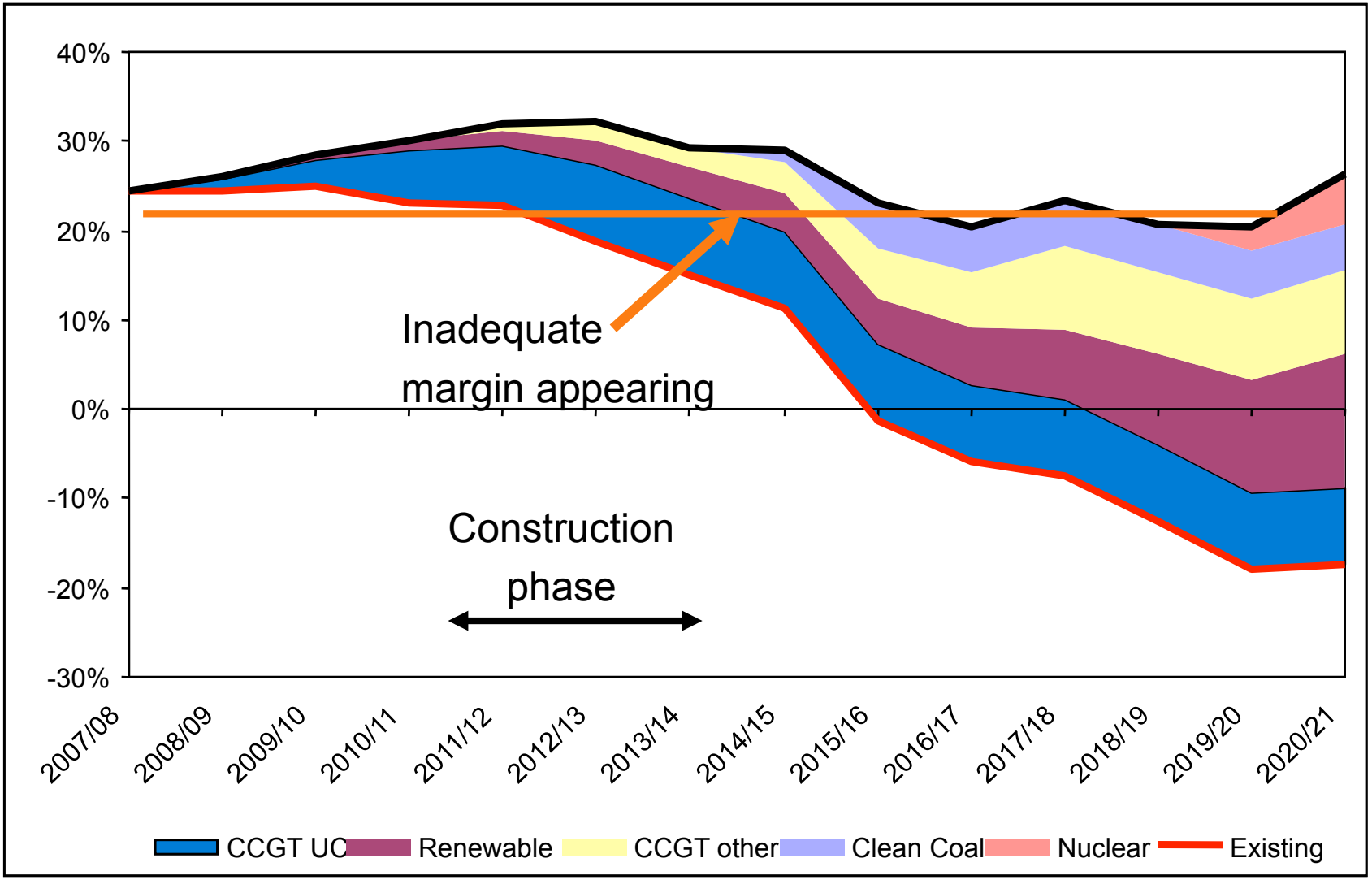
Impact of New Generation on the Margin



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Current Consents Regime

Pipelines & Electricity Underground Cables

- Permitted development – not necessary to apply for planning permission from LPA's
- Environmental Impact Assessment consent mandatory for pipelines >40km & >800mm Ø from DECC or Scottish Government (may be required for shorter pipelines >7barg).
- Easement from landowners & occupiers.

Gas AGIs & Substations

- Planning permission from local planning authority.
- Land purchase (or lease) from land owner / occupier.

Current Consents Regime

Issues

Multiple primary consents & decision-making bodies for individual projects

- Government & local planning authority approvals

Where local authorities take the decisions

- Little inclination to accept national need in the face of local opposition
- No local political will to approve proposals

Pipelines & overhead lines often pass through many local authority areas

- Dealing with Multiple Local Authorities
- NIMBYs

Planning Reform Agenda

Case studies of major decision timings (months)

Scheme		Application to Inquiry	Length of Inquiry	Close of Inquiry to receipt of report	Receipt of report to decision	Total time
M6 Toll Road	1992 – 1997	28	16	17	4 (+20)	65 (85)
Heathrow T5	1993 – 2001	27	46	21	11	86
Upgrade of West Coast Main Line	2000 – 2003	11	11	7	8	37
Second Yorkshire Line	1991 – 1998	9	7	11	50	77

Planning Reform Agenda

Public attitudes towards hypothetical developments proposed in their community

	Strongly oppose	Somewhat oppose	Somewhat support	Strongly support	Net opposition
Waste Collection/landfill site	80	6	3	9	-73
Power plant or utility	**77**	**6**	**5**	**8**	**-70**
Quarry	75	7	5	7	-70
Office	53	7	9	27	-24
Retail park	54	7	9	27	-24
Supermarket	50	7	10	31	-16
New road project	36	8	15	36	7
School	10	8	15	61	54

Planning Act 2008 Overview

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Why Might the IPC Refuse Consent?

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Environmental Targets

Reduction in Greenhouse gas emissions

- Reduce emissions of NOx, SOx, CO & CO_2

Adhere to pollution control legislation

Continually improve environmental performance

Meet the Environment Agency and Scottish Environmental Protection Agency requirements

Potential Investment and Development

New Supplies

- West of Shetland
- Norway
- LNG

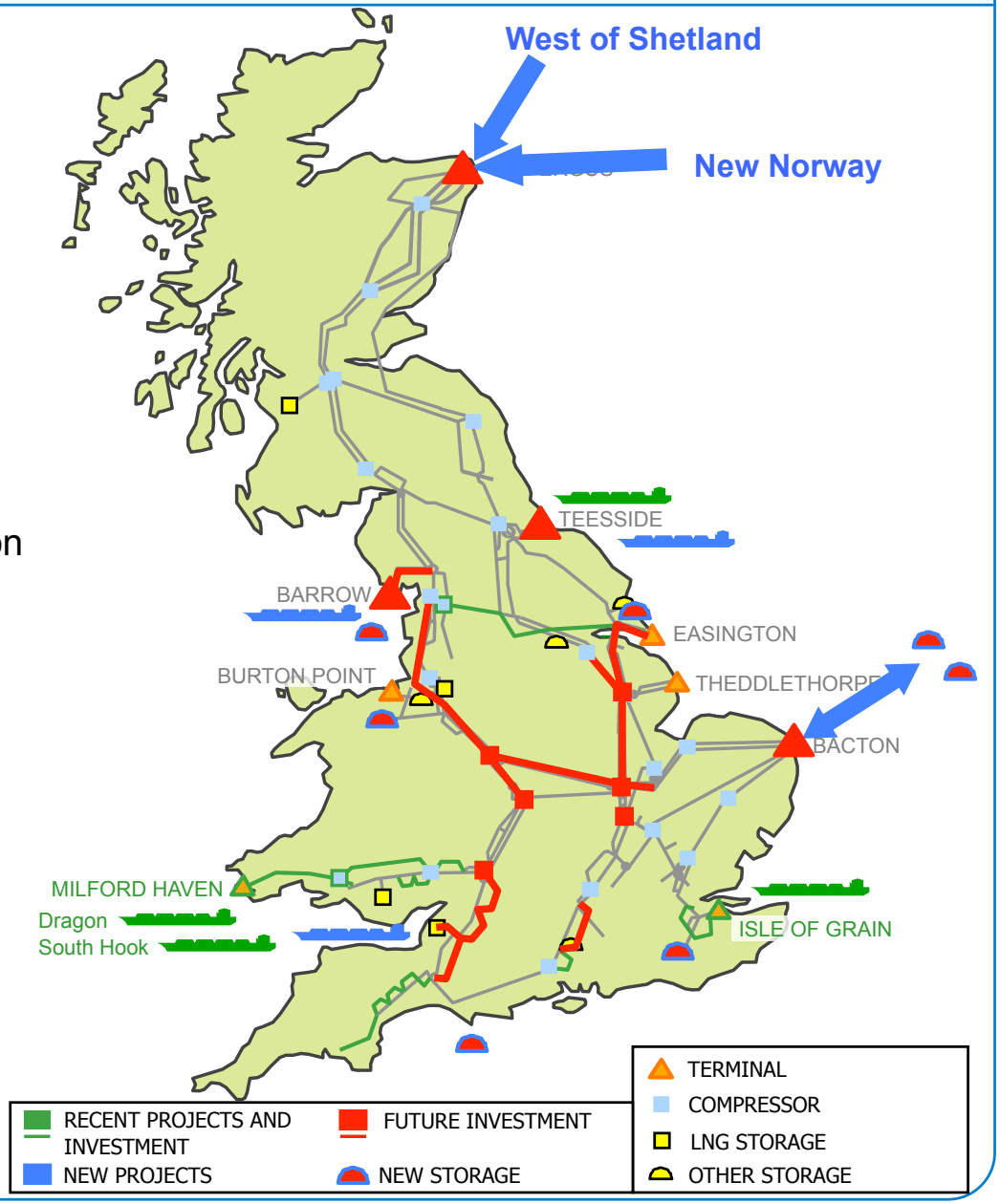
New Offshore Storage

- North Sea - Southern Basin into Bacton
- Irish Sea into Barrow

New Onshore Storage

- Salt Caverns
- Depleted Fields

NTS Reinforcement



Summary

Going forward, National Grid will manage an NTS that is increasingly complex

- More flexibility
- Geographical location of New Entry and Exit points
- Can deliver demand given a changing supply pattern.
- Can operate efficiently and effectively with increasingly stringent green credentials.

Any Questions?