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CAMBRIDGE | Electricity Policy  
Research Group

# *Regulation and Risk in the Gas and Railway Sectors*

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# *Outline*

- We discuss:
- GB Gas Distribution Price Control Review
  - 2008-13
  - Final Proposals December 2007
- GB Network Rail Periodic Review 2008
  - 2009-14
  - Draft Determinations June 2008
- Cross-sectoral Learning and Critique

# *Regulated UK Gas Industry*

- National Grid Gas Transmission
- 8 distribution regions:
  - 4 owned by National Grid
  - 2 by Scottish and Southern
  - 1 by consortium, including United Utilities
  - 1 by consortium, including Macquarie Bank

# *Gas distribution*

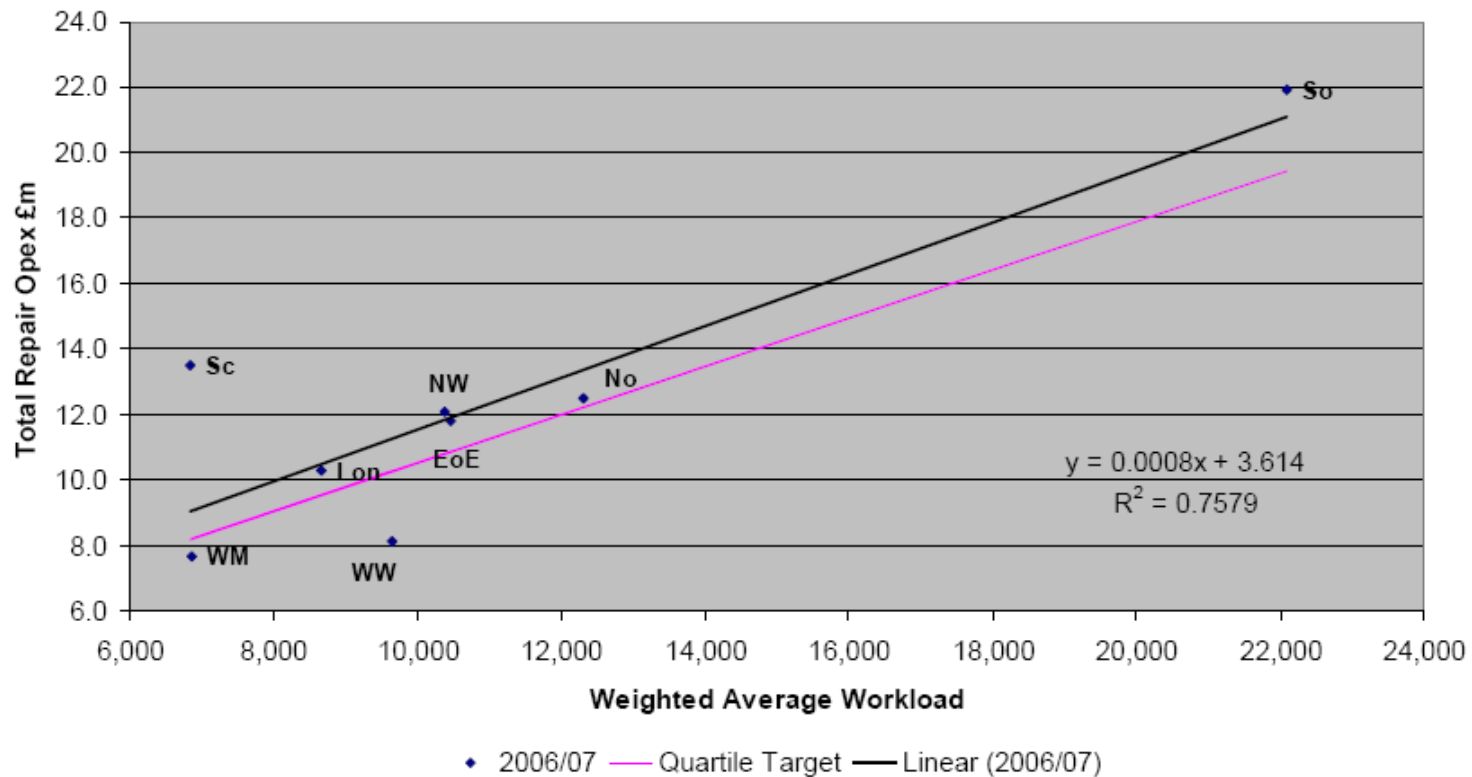
- Voluntarily separated from transmission in 2005
- Price control review thought to be generous
- £2470m p.a. revenue for 2008-13
  - No volume driver
  - Input prices predicted
  - Impact of major legislation allowed for

# *Assessment of Opex*

- 3 studies examined
  - benchmarking exercise of total controllable opex and Total Factor Productivity (TFP) analysis
  - review of direct operating activities together with capex / repex
  - review the indirect opex (support service) activities.
- Use simple subcategory regressions (not whole company benchmarking)
- Cost allocations checked
- Labour rates accounted for
- Fixed uplift for capex / opex tradeoffs

# Example of Opex benchmarking

Figure 3.1 – Repair regression 2006-07 actuals



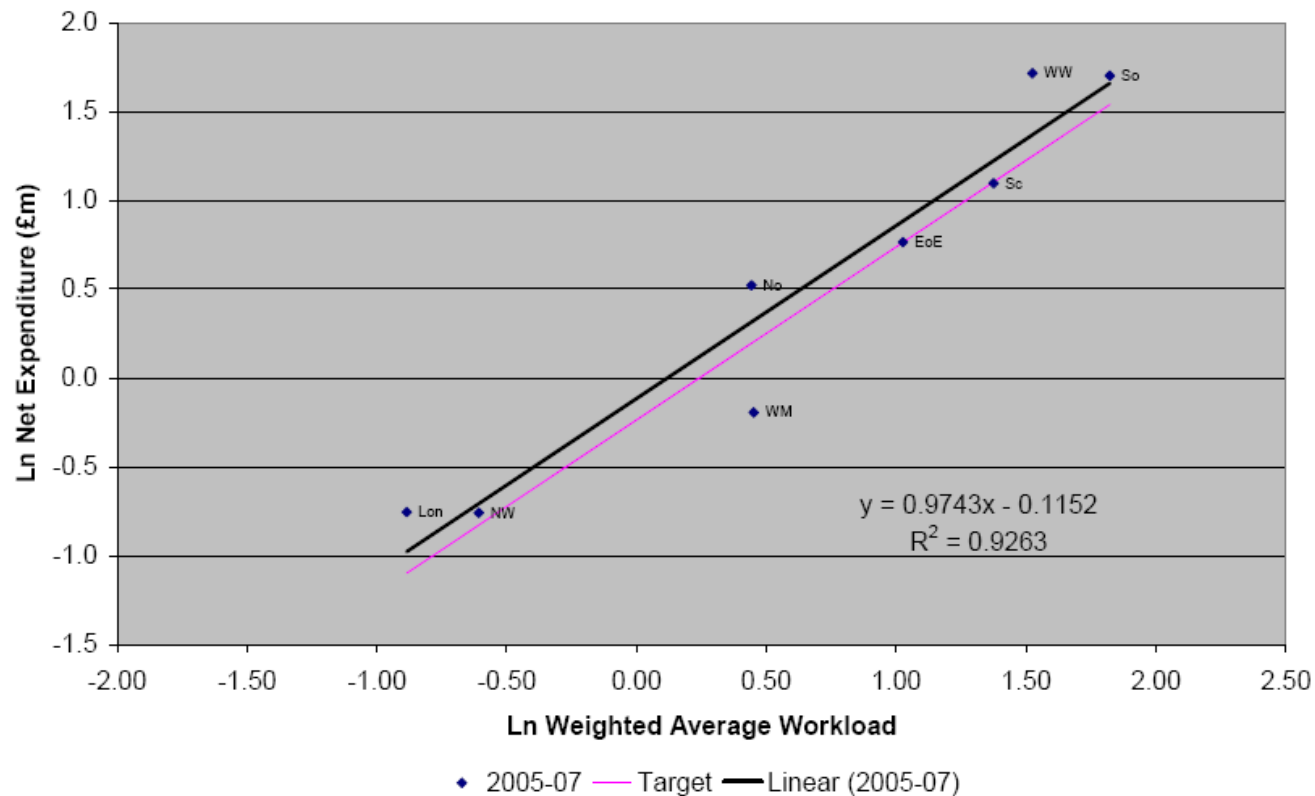
Source: GDPCR Final Proposals, p.11.

# *Assessment of Capex/Repex*

- Detailed review by PB Power
- Menu regulation to provide incentives
- Fixed baseline capacity with flexibility
- Analysis of capex requirements simple
  - Distinguishes Capex (inc. connections and reinforcement), Repex (replacement)

# Assessment of Capex/Repex components

Figure 4.2 – Regression of 2005-07 mains reinforcement capex against weighted average workload (2005-06 prices)



Source: GDPCR Final Proposals, p.34



# *Menu Regulation: outturn selections by companies*

**Table 6.2 - IQI results**

	Total 5Yr capex + repex forecast	Total 5Yr capex + repex allowance (pre IQI)	IQI Ratio	Incentive strength	Additional income
	£m	£m			£m
East of England	754.8	703.0	107.6	36%	10.9
London	758.1	679.4	107.6	36%	8.9
North West	715.0	607.2	107.6	36%	9.5
West Midlands	462.0	440.2	107.6	36%	7.1
Northern	694.6	625.4	108.8	36%	8.4
Scotland	512.5	438.3	114.4	33%	3.0
Southern	1,266.8	1,090.3	114.4	33%	7.3
Wales and West	754.7	633.6	114.0	33%	4.5
<b>Total</b>	<b>5,918.6</b>	<b>5,217.4</b>			<b>59.7</b>

# *Sustainable development*

- 0.75% of GB GHG emissions from gas distribution system as leaks.
- Incentive scheme to reduce these
  - Shadow price of carbon = £26.5 (2007 prices) for 2009.
  - Implies £28.5 per MWh of gas (in addition to gas cost)
  - £7m cap - £10m collar
- Innovation funding incentive to promote long-term improvements
  - up to 0.5% of revenue with 80% pass through

# *External Risk Assessment*

- Oxera on behalf of companies:
  - Used international data to show asset betas of gas higher than pure transmission companies
- CEPA on behalf of Centrica:
  - Relative risk analysis is not to do with Beta because it is to do with non-systematic risk.
  - Oxera flawed because it is comparing different regulators.
  - Market prices for regulated companies indicate lower cost of capital.
- Ofgem accepted low cost of capital arguments

# *Weighted Average Cost of Capital*

**Table 9.1 - WACC for GDPCR with comparators**

	GDPCR: Final Proposals	GDPCR: Updated Proposals	TPCR: Final Proposals	CC: BAA (Heathrow)
Cost of debt	3.55%	3.55%	3.75%	3.55%
Cost of equity	7.25%	7%	7%	7.33%
Gearing	62.50%	62.50%	60%	60%
Vanilla WACC	4.94%	4.84%	5.05%	5.06%

Note: Vanilla WACC: It is calculated as a pre-tax cost of debt and a post-tax cost of equity since there is separate specific allowance for tax costs.

Source: GDPCR, p.106

# X factors

**Table 10.3 - Allowances by GDN including additional factors (£m, 2005-06 prices)**

		Final proposals - core allowed revenue		Shrinkage price adjusted	Meter work adjusted	IFI adjusted	Final proposals - with all additional adjustments	
		Average annual allowed revenue 2008-13	Average X	Average annual allowed revenue 2008-13	Average annual allowed revenue 2008-13	Average annual allowed revenue 2008-13	Average annual allowed revenue 2008-13	Average X
NGG	East of England	430.5	-0.3%	-5.4	2.4	1.7	429.2	-0.2%
	London	282.1	-4.9%	-3.1	1.3	1.1	281.4	-4.8%
	North West	299.0	-1.6%	-3.9	0.6	1.2	296.9	-1.3%
	West Midlands	231.7	-2.1%	-3.2	2.3	0.9	231.8	-2.1%
NGN	Northern	290.3	-2.0%	-4.1	2.6	1.2	289.9	-2.0%
SGN	Scotland	201.5	-1.2%	-2.2	2.7	0.8	202.8	-1.4%
	Southern	468.1	-2.7%	-5.8	7.5	1.9	471.7	-3.0%
WWU	Wales and West	267.3	-2.0%	-4.1	4.7	1.1	269.0	-2.2%
	<b>Total</b>	<b>2,470.4</b>	<b>-2.0%</b>	<b>-31.7</b>	<b>24.1</b>	<b>9.9</b>	<b>2,472.6</b>	<b>-2.0%</b>

Source: GDPCR Final Proposals, p.113.

# *Overall assessment*

- Volume risk removed
- Re-openers possible
- Strong incentives
- Generous settlements on opex and capex
- Low allowed rate of return
- New structure should deliver benefits



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# Railways



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# *The Privatised Railway Industry*

Six heavy maintenance depots	Apr to Jun 95
Red Star Parcels	Sep 95
Two Freight operators	Dec 95 to Nov 97
Three ROSCOs	Jan/Feb 96
Thirteen IMC/IRCs	Feb to Jul 96
Railtrack	May 96
Twenty-five TOCs	By end of 1996/97



# *Post Privatisation*

- April 1997- October 2000
  - November 1999, Ladbroke Grove accident
- October 2000 – October 2002
  - Severe disruption following Hatfield crash
  - October 2001, Railtrack (PLC) put in administration
- October 2002 – Present
  - October 2002, Network Rail (CLG) created
  - April 2005, SRA functions merged into DfT
  - April 2006, ORR assumes responsibility for rail safety

# *Network Rail*

- Costs have risen substantially since Hatfield
- Government provides 51% of railway resources
- HLOS – High level output standards - set for safety, reliability, capacity.
- SOFA – Statement of available resources

# Government Projections

<b>Table 12.1: Source and application of funds</b>						
<b>Forecasted Sources and Applications of Funding</b>						
<b>£bn nominal</b>	<b>2009/10</b>	<b>2010/11</b>	<b>2011/12</b>	<b>2012/13</b>	<b>2013/14</b>	<b>CP4 Total</b>
Passenger revenue	6.7	7.3	7.8	8.4	9.0	39.2
SOFA	3.2	3.0	3.1	3.0	3.0	15.3
Other	0.7	0.8	0.8	0.8	0.8	3.1
<b>Total Cash In</b>	<b>10.6</b>	<b>11.0</b>	<b>11.7</b>	<b>12.2</b>	<b>12.8</b>	<b>57.6</b>
Cost of passenger services	5.0	5.2	5.3	5.6	5.7	26.8
Network Rail baseline cost (O,M,R,E)	4.3	4.1	4.1	3.9	3.8	20.2
Network Rail financing payments	1.6	1.6	1.7	1.7	1.8	8.4
<b>Total Cash Out</b>	<b>10.8</b>	<b>10.9</b>	<b>11.1</b>	<b>11.2</b>	<b>11.4</b>	<b>55.4</b>
<b>Headroom</b>	<b>(0.2)</b>	<b>0.1</b>	<b>0.6</b>	<b>1.0</b>	<b>1.4</b>	<b>2.9</b>
<b>Additional borrowing:</b>	<b>1.6</b>	<b>1.7</b>	<b>1.5</b>	<b>0.7</b>	<b>0.5</b>	<b>6.1</b>
HLOS requirements:						
Cost of infrastructure enhancements	1.2	1.5	1.6	1.2	1.4	7.0
Cost of additional rolling stock	0.2	0.2	0.3	0.3	0.3	1.2
Cost of financing HLOS	0.1	0.1	0.2	0.2	0.3	0.8
<b>Total Cash of HLOS</b>	<b>1.5</b>	<b>1.9</b>	<b>2.1</b>	<b>1.7</b>	<b>1.9</b>	<b>9.0</b>

Source: DfT, 2007, p.128.

# *Draft Determinations*

- Total budget £27.8 bn over 5 years
- Big reductions in allowed expenditure:
  - 23% on maintenance and renewals
  - 16% on controllable operating expenditure
- Substantial enhancements
- Government charging for loan guarantees

# *Breakdown of revenue*

**Table 5: Summary of our CP4 efficient expenditure assumptions**

£m (2006-07 prices)	Network Rail's SBP/SBP update	Our determination	Difference
Controllable opex	3,776	3,392	(10%)
Non-controllable opex	1,796	1,776	(1%)
Maintenance	4,889	4,584	(6%)
Renewals	11,658	10,504	(10%)
Enhancements	9,029	7,507	(17%)
<b>Total</b>	<b>31,148</b>	<b>27,763</b>	<b>(11%)</b>

Source: Periodic Review Draft Determinations, p.13

# *Assessment of Efficiency*

- Large number of bottom up and top down efficiency studies undertaken by the company
- Regulator also looked at maintenance and renewals expenditure:
  - ‘lasting infrastructure cost benchmarking’ (LICB) dataset compiled by the International Union of Railways (UIC). Using maintenance and renewals expenditure and cost driver data for 13 European rail infrastructure managers, 11 years to 2006. NR: 37% inefficiency
  - sub-national data from five rail infrastructure managers in Europe and North America collected with the assistance of the comparator companies. Using up to five years data. NR: 44% inefficiency
- ‘high degree of reliance’ (p.134) on international benchmarking in reaching conclusions

# *Assessment of Capex*

- Enhancement projects specified
- No menu regulation
- No emissions incentives
- Strong incentives for generating growth above baseline

# *Risk Mitigation*

- Risk buffer
- Ring fencing of investment expenditure
- Ex post assessment of logged up expenditure
- Specific allowances in enhancement projects
- RPI risk handled via grant indexing
- Interim review if financial trigger of x1.35 adjusted interest cover ratio (AICR) breached



# *Weighted Average Cost of Capital*

*Table 1 – WACC (without cost of debt 'triggers')*

Sample	Lower	Upper
Post-tax Cost of Equity	6.5%	7.0%
Pre-tax Cost of Debt	3.25%	3.5%
Gearing	62.5%	60%
Post-tax vanilla WACC	<b>4.5%</b>	<b>4.9%</b>

Source: Risk Adjusted Cost of Capital for Network Rail, CEPA, April 2008, p.ii.

# Risk Assessment

Table 2: Relative business risk analysis

Type of risk	Closest comparator	More risky than...	Less risky than...
Demand	Electricity transmission Gas transmission Gas distribution	None	Airports Water & sewerage Electricity distribution
Opex	Electricity transmission and distribution Gas transmission and distribution	None	Airports * Water & sewerage **
Maintenance/ renewals	Water & sewerage	Airports Energy distribution Energy transmission	None
Enhancement	Water & sewerage	Airports Energy distribution Energy transmission	None
Reopeners	Water & sewerage †	None	Airports Energy distribution Energy transmission
Service quality	Energy distribution	Water & sewerage Energy transmission	Airports ‡
Regulatory/ political.	If any difference, small and gradually diminishing.		

Source: CEPA,  
2008, p.36-37.

# *Cross-sectoral lessons*

- Learnings for Railways from Gas
  - Incentives against underperformance unclear
  - Sustainability incentives needed
  - Risk handled arbitrarily
  - Ownership structure an issue
- Learnings for Gas from Railways
  - Lack of proper international benchmarking

# *What can both learn?*

- Negotiated settlements not present
  - (e.g. CAA (Pollitt, 2008), Canadian pipelines (Doucet and Littlechild, 2006))
- Competitive tendering not built in to regulatory asset base
  - (e.g. Argentine transmission (Littlechild and Skerk, 2008))
- Lessons from Public Private Partnerships, not present in Railways

# *Future challenges*

- Volume risks remain with customers
- Handling tradeoffs between sectors on climate (gas/electricity) and safety (rail/road)
- Avoiding socially unacceptable high rates of return
- Combining subsidy with private ownership
- Assessment of risk-return tradeoffs
- Separation of return for new and old investment

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