Network Losses – Opportunities and Incentives

Ofgem DPCR5
Environmental Workshop
23rd May 2008

ScottishPower Energy Networks

ScottishPower

IBERDROLA

Agenda

Context & Opportunity in DPCR5

Network Losses

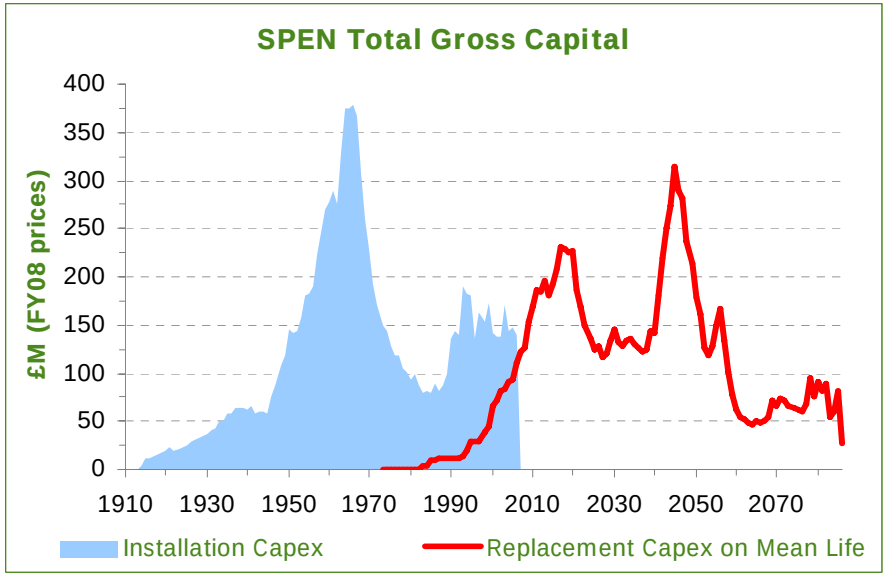
Current trends & issues with current mechanism

Options for DPCR5

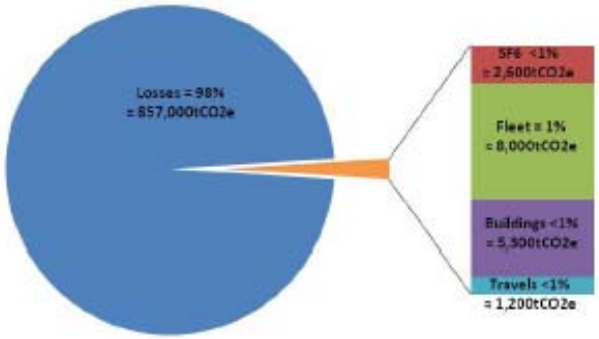
Conclusions

Environmental Opportunity

Significant proportion of the UK asset base is reaching the end of its operational life during a particularly opportune period from an environmental perspective



Planned investments in SP Energy Networks for 2008 - 2010 total **€2.1 billion** of which more than half is replacement



98% of DNO carbon footprint from network losses
(Ofgem DPCR5 initial consultation)

Ageing high loss equipment → **Modern equivalent**

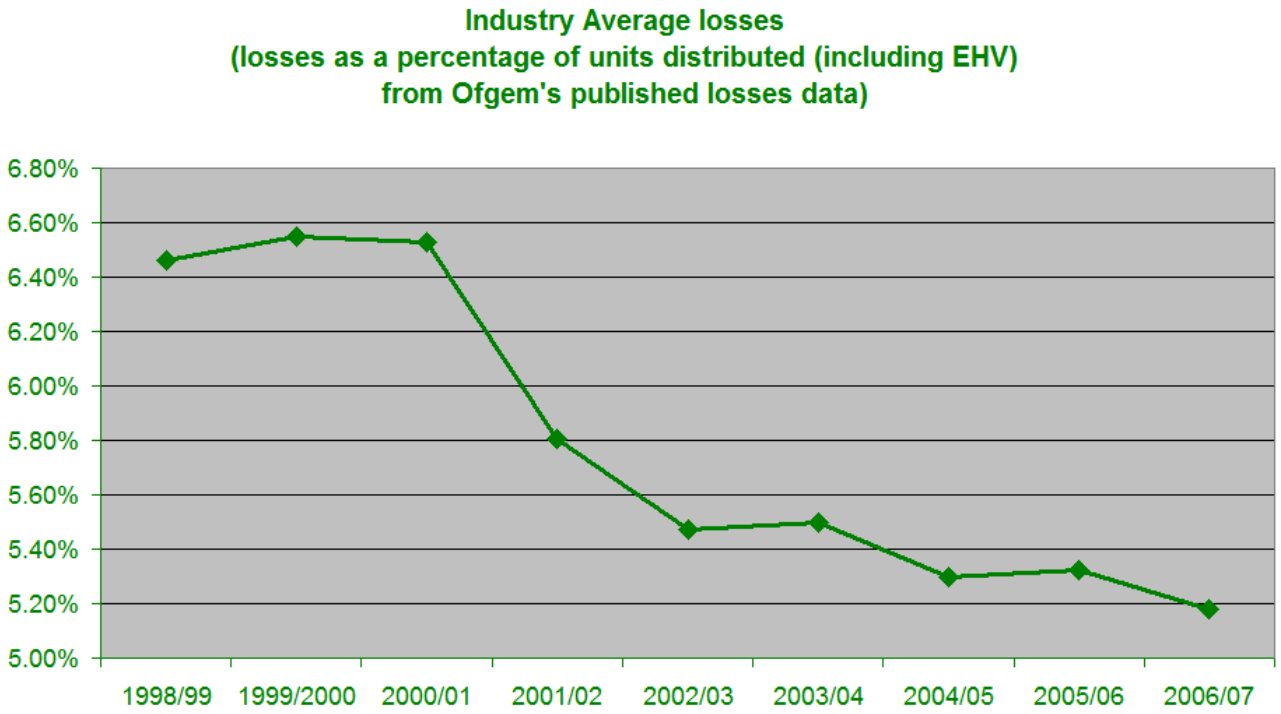
Typical life 30-80 years

lower loss ?

optimum loss ? (higher unit costs) x

Reported losses

Material volatility witnessed that is not attributable to technical losses



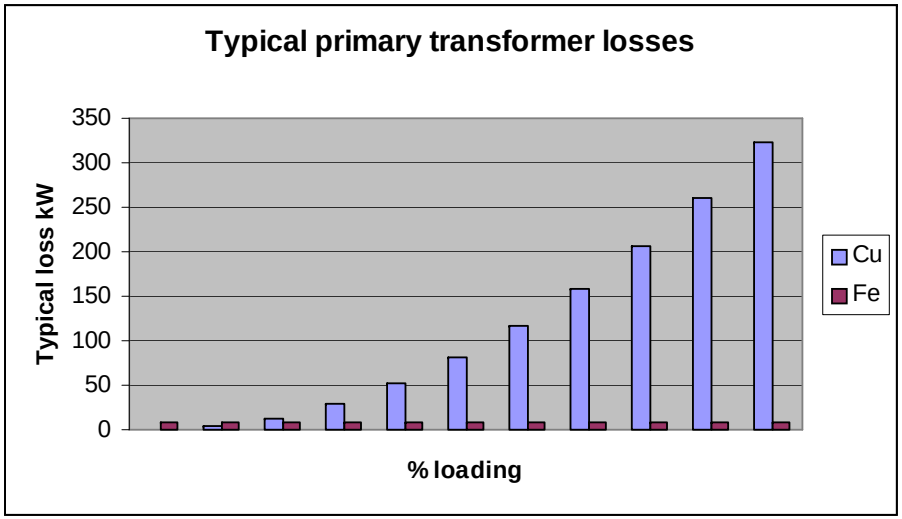
The industry average losses percentage has reduced 20% from approx. 6.5% to 5.2% from 1998/99 to 2006/07.

Technical Network losses

Network losses are a function of both network and demand characteristics

Fixed iron losses – independent of I

Variable copper losses – I^2 relationship



Market structure currently encourages low cost / higher loss new connections

Typical network loss contributions

132kV network	3%
132/33kV transformers	8%
33kV network	5%
Primary transformers	12%
HV network	18%
Secondary transformers	23%
Low voltage network	31%

Non Technical Network losses

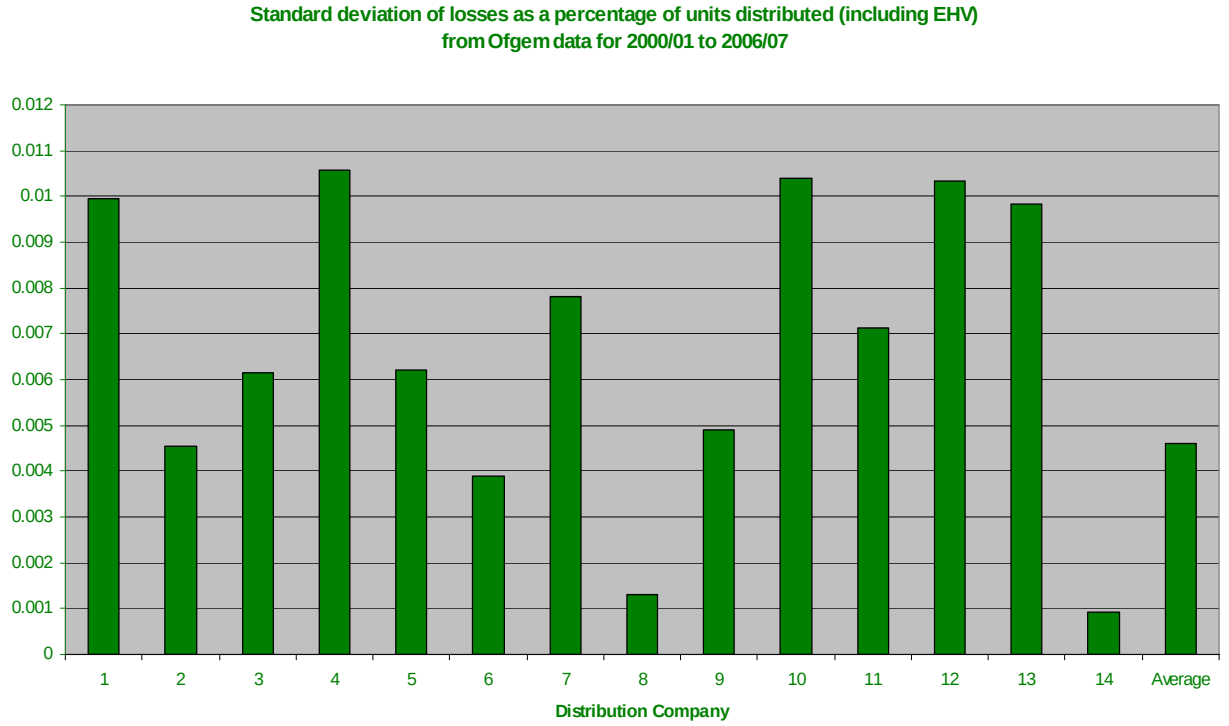
Significant proportion of measured network losses are materially out-with the control of DNOs

Errors in electricity settlement

Theft - estimated at 1-1.5% (2)

A significant percentage of witnessed reduction is due to the volatility of non technical losses

"It is important to remember that measured distribution losses reflect a number of factors apart from network losses. We believe that non-technical losses amount to a significant proportion of overall units unaccounted for and are likely to contribute to significant variation in the reported losses percentages both across DNOs and over time." (1)



(1) Ofgem Electricity Distribution Losses – January 2003

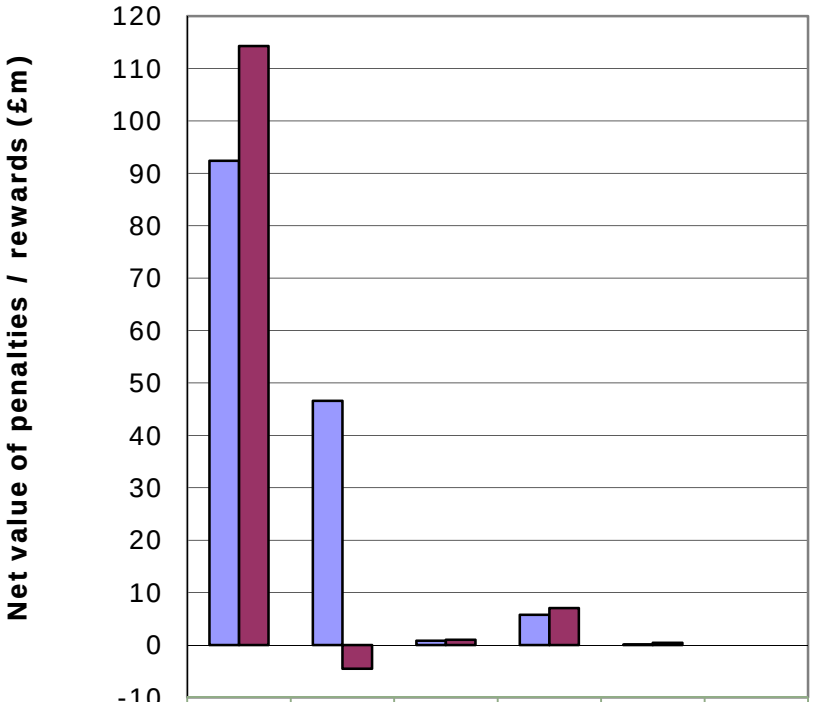
(2) Response by the United Kingdom Revenue Protection Association (UKRPA) 22 March 2003, to OFGEM CONSULTATION

DPCR4 losses incentive

Network losses witnessed cannot have been delivered physically

- **Most material DPCR4 incentive mechanism**
- **Driven by volatile and subjective data**
- **Fixed targets increase exposure to volatility**
- **Reward of c. £100m p.a.**
- **Significant customer costs**

Do the environmental benefits delivered match the reward?



	Losses Rollover	Discretionary Reward			DG	RPZ
2005-06	92.40	46.58	0.80	5.77	0.07	0.00
2006-07	114.2	-4.53	1.00	7.05	0.42	0.00

Source: **The key challenges for network regulation, Stephen Smith, 5 March 2008**

Technical Network losses tool kit

Technical solutions are typically more suited to input based incentives

	Relative Cost	Relative Opportunity
Transformers – new and replacement	Small incremental	High
Network voltage up-rating	High	Medium
Network optimisation – planning timescales	Small incremental	Low
Network optimisation – operational timescales	Medium	Medium
Transformer switching	Medium but significant risk	Low
Cable over-sizing	Very high	V low

DPCR5 losses opportunities

Implement regulatory mechanisms that will deliver clear environmental benefits from DPCR5 through into the second half of 21st century

Technical losses straw-man

- Input based incentives
- Agreed programmes
- Audited network model

Customer based initiatives

- Demand side management?
- Power factor management?
- Small scale generation?
- Smart metering?

Conclusions

DPCR5 presents a significant opportunity to deliver real environmental benefits

DPCR4 technical losses are masked by non-technical volatility

DPCR4 improvement primarily non-technical

Huge opportunity in DPCR5 to make a difference

Upturn in planned replacement of key assets

Time is right to move to input based mechanism

Analysis required to establish appropriate value of avoided losses

Life-time carbon costs? Energy costs?