



Distributed (micro-) Generation
A vertically integrated energy company
perspective

World Gas Conference, 8th June 2006

Microgeneration contributes to UK energy policy goals

Fuel Poverty

Micro CHP can do as much for fuel poverty by 2030 as all energy efficiency measures put together, including micro CHP

Policy Studies Institute, January 2005

Environmental

Micro CHP is one of the most cost-effective Carbon mitigation technologies

Energy White Paper

Security of supply

Reduces need for RE back-up capacity

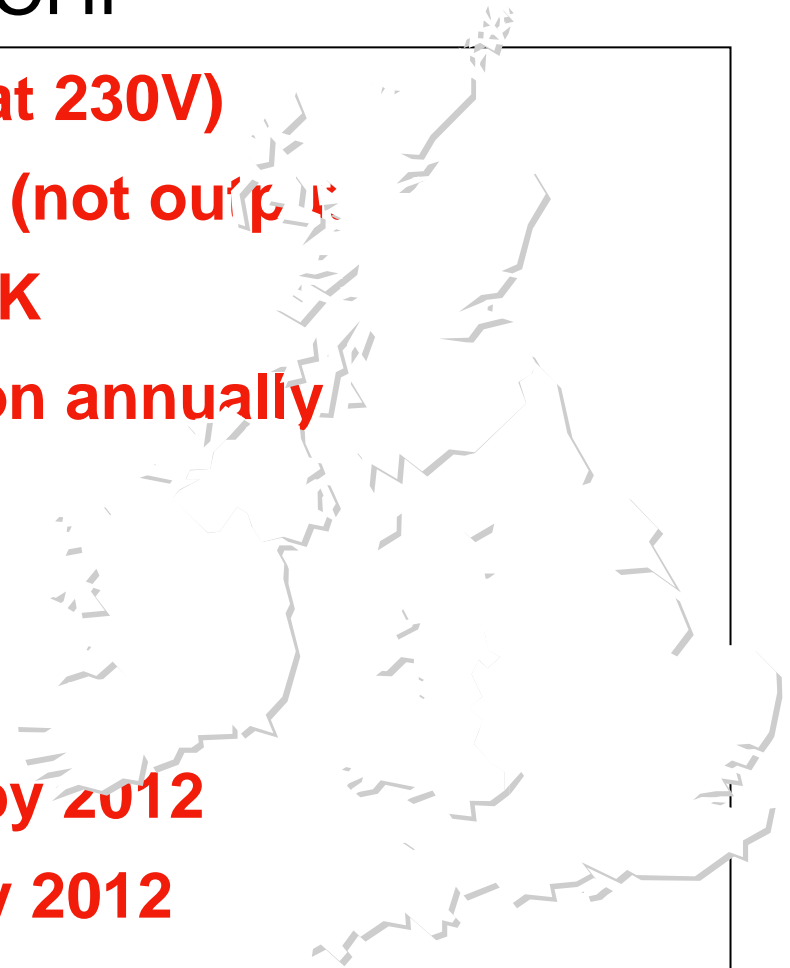
Environmental Change Institute, 2004

Competitive market

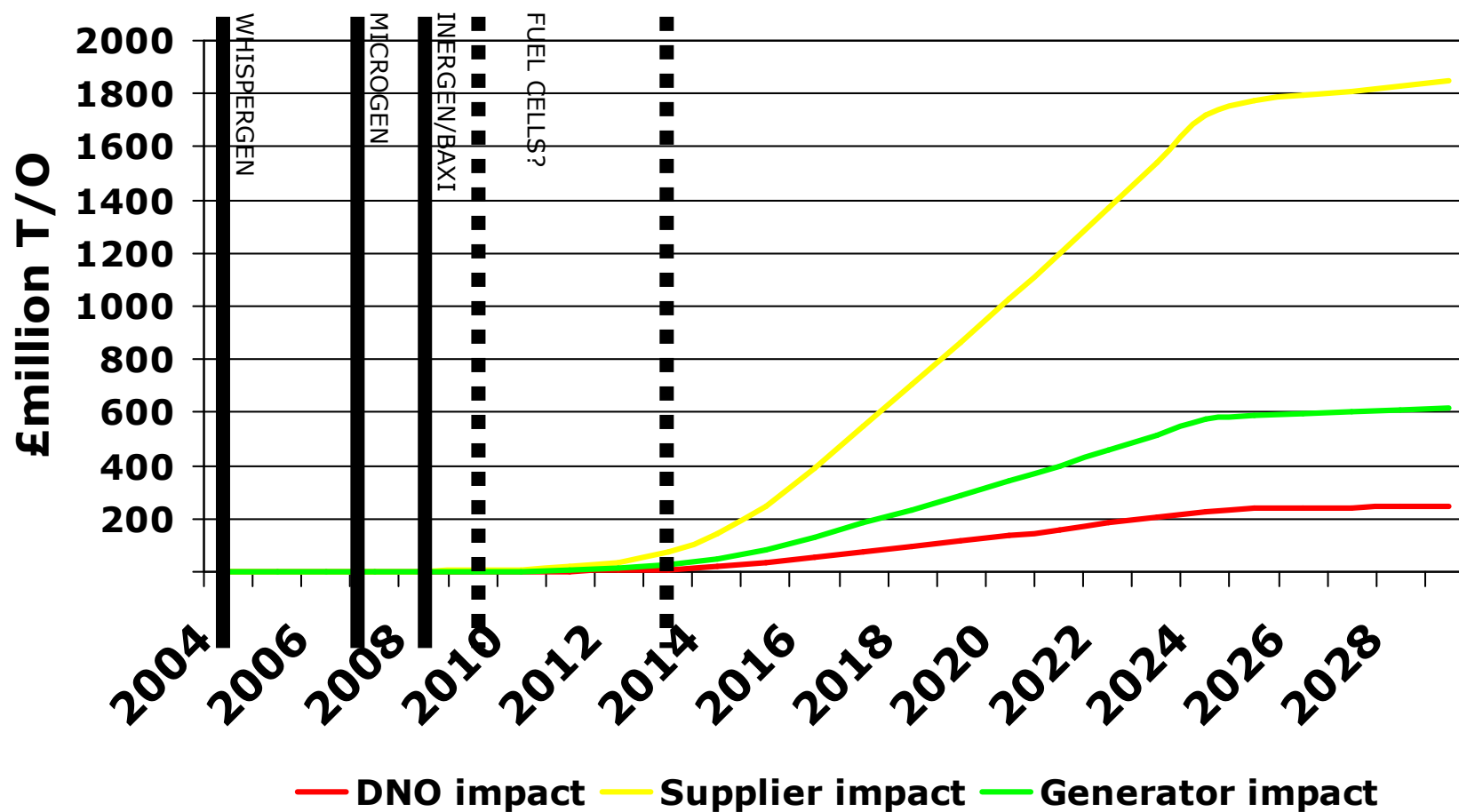
...savings in deferred network upgrades and improved operational efficiency estimated at up to £1.2 billion by 2020.

Potential UK impact of micro CHP

- **15-22GWe installed capacity (at 230V)**
 - **equivalent to nuclear capacity (not output)**
 - **12 million suitable homes in UK**
 - **33 million tonnes CO₂ reduction annually**
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- **~250,000 p.a by 2012**
 - **~1,000,000 installed systems by 2012**
 - **~1.5 million tonnes CO₂ p.a. by 2012**



Commercial impact of micro CHP



Micro CHP & generation

- **Avoids life cycle susceptibility to fuel cost escalation**
- **Avoids hidden costs & NIMBY objections**
 - Planning delays
 - Infrastructure
 - High up-front capital/Dormant investment
- **DG represents lowest overall capacity cost ***
- **Avoids step change reduction in kWh price on wholesale market****
- **Incremental investment risk (scaleable)**
- **Improved trading profile**
- **Diversified portfolio reduces trading risk**

*(Source: IEA/WADE)

** (Source: Boston Consulting Group)

"Likely need for additional capacity by 2015"

Implications for Distribution Network Operators

DG IS PART OF GOVERNMENT POLICY

- It will happen
- Distribution is a regulated business
- OFGEM recognises impact of DG on DNO
- OFGEM seeking appropriate incentive mechanisms
- Loss of revenue from transport
- Additional administrative costs
- Technical challenges of network impact

MITIGATION/OPPORTUNITIES

- Need to evaluate & understand technical impacts
 - SIAM study concludes reduced OPEX
 - Short term CAPEX increases in some areas
- Need to understand locational issues
 - Wind etc. 33kV (high impact)
 - mCHP 230V (little impact)
- Negotiate appropriate regulatory framework
 - Reward mechanism
 - Capacity payment
 - Ancillary services
 - Innovation Funding Initiative/RPZ
 - P2/5 benefits

Neutral impact on regulated business

Energy supply business opportunity

- **Customer acquisition & retention**
 - Better value for money for customer
- **Improved profitability**
 - Modified profile reduces cost to supply
- **Differentiator**
 - Not “just energy”
 - Visible energy efficiency
- **Brand value**
- **Contributes to licence obligation compliance (EEC)**
- **Product sales**

Profitability of micro CHP*

	Boiler/grid	mCHP 2006	mCHP 2007
Import tariff (cost) p/kWh	9.5 (9.0)	9.5 (9.0)	9.5 (8.5)
Annual import kWh	6000	3360	3360
Electricity bill (profit) £	570 (30)	319 (17)	319 (34)
Export tariff (value) p/kWh		4 (0)	4 (4)
Export total kWh		1130	1130
Export profit (loss) p/kWh		(45)	0
Export payment to customer £		45	45
Total energy bill (profit) £	1184 (58)	960 (3)	960 (65)

* Illustrative costs based on annual heat loss 24000kWh; electricity consumption 6000kWh

Summary

Microgeneration provides significant benefits & business opportunities

- Lower energy bills for customers
- Enhanced profitability for supplier
- Social and environmental benefits

...but significant obstacles remain

- Inability to recover full value of energy
- No long term mechanism to reflect environmental benefit
- Imbalanced tax regime
- Transaction costs destroy value