

Reaching our potential

Paper 1199

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Today

- A taster, concentrating on consumer behaviour
 - Methodology
 - (Results)
 - Key conclusions



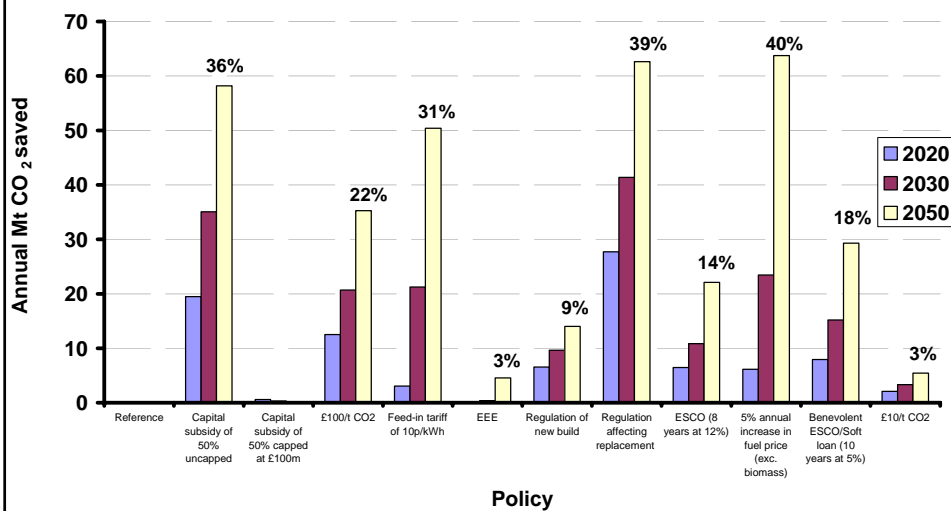
Goals

- Develop a tool to study the purchase of microgeneration technologies in the UK domestic sector
 - microCHP, fuel cells, biomass, heat pumps, solar thermal, wind, PV
- Assess effectiveness of interventions



A model allows an illustration of the potential of the technology and relevance of different policy scenarios

Annual Mt CO₂ saving from primary heating technologies



Microgeneration and its uptake are inherently uncertain

- For microgeneration technology to play a significant role in the UK mix, very substantial deployment is required (many millions of households)
- However, there are substantial uncertainties on the road to widespread microgeneration deployment:
 - How consumers react to the technologies
 - The rate of technology development
 - How the overall energy landscape changes
- The main value of any model in the sector is to illustrate the relative effects of different policies
- Not trying to predict the future!

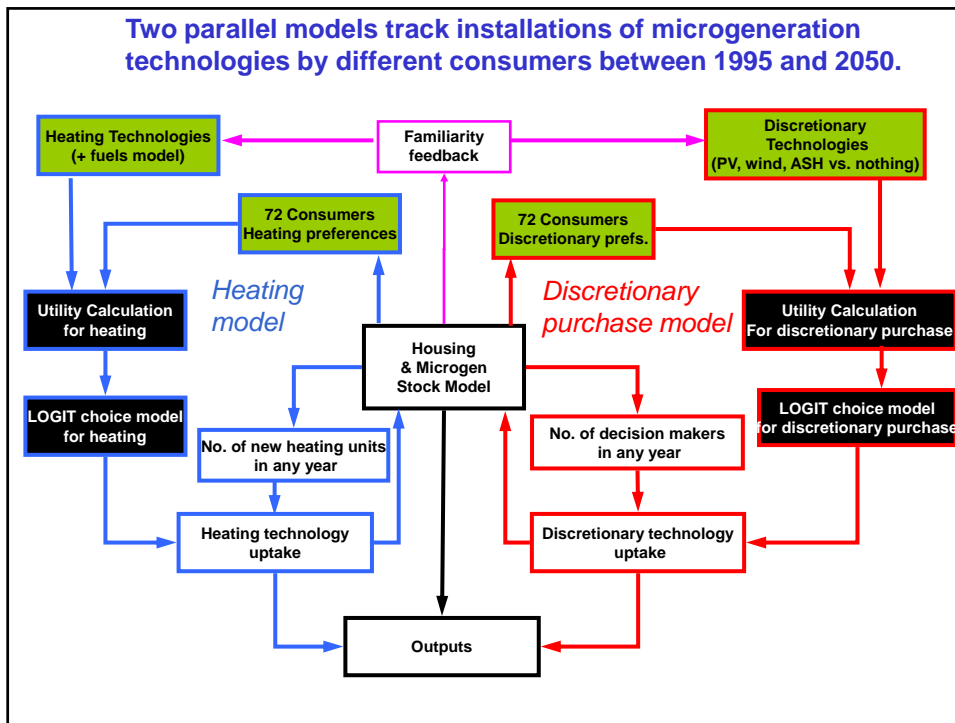


The model

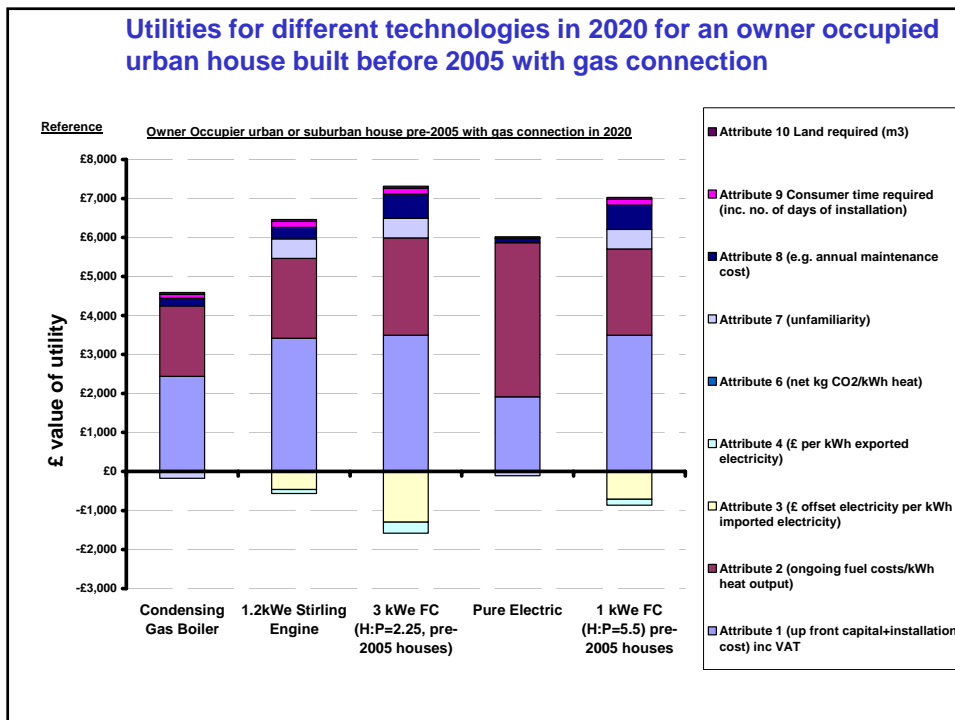
- First model for Department of Trade and Industry
 - Simple economic model where uptake was related to consumers' willingness to pay a given cost multiple of the incumbent technology's price
 - Market limits and maximum technology growth rates controlled uptake
 - Technologies considered independently - no choice between technologies and hence results not additive
- Upgrade, by developing a new model for consumer purchase which:
 - Models the choices in front of consumers when evaluating a microgeneration purchase
 - Incorporates non-cost attributes of technologies, such as the time required by the consumer and the space required by the technology and relative weighting of capital cost and reduction in fuel cost.
 - Is capable of examining combinations of policies



Two parallel models track installations of microgeneration technologies by different consumers between 1995 and 2050.

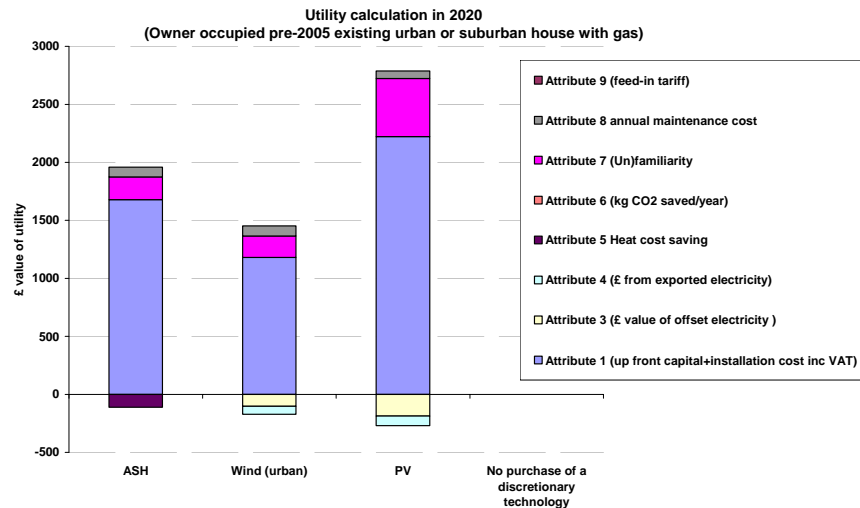


Utilities for different technologies in 2020 for an owner occupied urban house built before 2005 with gas connection



For discretionary technologies, under the base case, the option of making 'no purchase' has the highest utility and as such is favoured in the majority of cases.

Reference



Consumer coefficients were calibrated against engineering assumptions, literature and historic data

- A three-pronged approach was used to calibrate consumer coefficients:
 - an 'engineering' approach was taken to provide reasonable estimates for consumer coefficients, using estimates of value of time.
 - literature on consumer discount rates and priorities (DEFRA/Oxera study of insulation uptake)
 - calibrated against historical uptake rates and trends, particularly of condensing gas boilers, and the ratios of gas:oil:electric:LPG heating systems, and microgeneration technologies

High level results

- Without any form of policy intervention, the CO₂ effect of domestic microgeneration appears limited– below 2 MtCO₂/year by 2050
- The model suggests if well supported microgeneration technologies could make a combined saving of well over 60 MtCO₂/year by 2050
- The potential for savings by 2020 are more limited, even with supportive scenarios (including some form of compulsion) a combined saving above 10 MtCO₂/year appears unlikely by 2020. This is still significant compared to other sectors
- Policy interventions recommended...
 - Technology investment
 - Compulsion



Conclusions - Consumer behaviour

- Have been pessimistic about consumers – assumed 20% discount rate and discount period of 3-8 years (not lifetime of technology)
- To encourage mass market uptake of microgeneration, the following measures are required:
 - Ensure consumers have access to commercial type economic tools for purchasing and operating microgeneration technologies – e.g. encouraging adoption of ESCO arrangements
 - Low cost loans
 - Increase awareness – greater awareness of technologies and the economic case for microgeneration will increase penetration
 - Value of carbon



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