

Introduction to UK GSHP Scene

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Agenda

- Scale & development of market
- Fit in heating/cooling mix
- Options
- Structure of industry
- Challenges and debates
- Role of GSHPs in energy & carbon saving

Scale & development of market - 2006 figures



Country	Number installed	Date started
Austria	23 000	
Canada	36 000	
Germany	40 000	1996
Sweden	200 000	1980
Switzerland	25 000	1980
UK	3 000	
USA	600 000	1996

Mature markets have codes of practice, standards & training – where GSHPA fits in

Scale & development of market



- Growth – 50 to 100% per annum
- Split between domestic 2 to 20 kW
- And Commercial / Industrial at 5 MW plus

Fit in heating/cooling mix

- Government wants to promote domestic GSHPs as heating only
- GSHPA supports this
- Where cooling (and heating) is required, GSHPs are far more efficient and effective than standard aircon
- Should be first choice in Commercial and Industrial applications

- Extract heat from underground
 - Trench systems (1 m to 2 m deep)
 - Borehole systems (up to 150 m deep)
 - Lake systems
- COP varies between 1 and 8 to 1
 - @ 8 to 1, 8 kW heat energy for 1 kW electricity
 - Typically CoP between **3 to 1** and **5 to 1**
- Overall CO₂ savings depend on electricity source being used

Structure of industry

- Domestic Installation Companies
- Commercial/industrial Companies
 - Some provide both services
- Drillers and ground works suppliers
- Consultants (especially for ground design)
- British, European & Japanese manufacturers
- Academics and training providers

Challenges & debates

- Renewable Heat:
 - Solar, Biomass & Geothermal
- GSHP is **98% solar** and **2% geothermal**
- CHP must be designed on heat load
- microCHP, esp fuel cell is not market ready
- HPs feed into, where appropriate, district heat
- Biomass is limited resource & many apps
- Solar cannot cover 100% heating
- **Heat pumps are our only sustainable technology that can cover 100% heat load**
- Drive decarbonisation & grid security

Role of GSHPs in energy & carbon savings



The carbon and financial savings of Heat Pumps

GSHP @350% eff & 0.43 kgCO₂/kWh_e = **0.12** kgCO₂/kWh

Gas Con@80% eff* & 0.19 kgCO₂/kWh_g = **0.24** kgCO₂/kWh

In this case, GSHP is **50% CO₂** improvement and **38% running cost** saving (based on 3.3 p/kWh gas and 8.9 p/kWh electricity-BSRIA and carbon figures-SAP 2005)

80% gas condensing system efficiency is based on currently ongoing EST field trials. This figure is yet to be published and might be subject to change. However, our understanding is that it is far more accurate than stated boiler efficiency of 91%. Heat pump system efficiency of 350% equates to a realistically GSHP achievable CoP of 3.5 (ask GSHPA for evidence)

Thank you for listening

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