



Environment  
Agency

# GSHPs at the Environment Agency

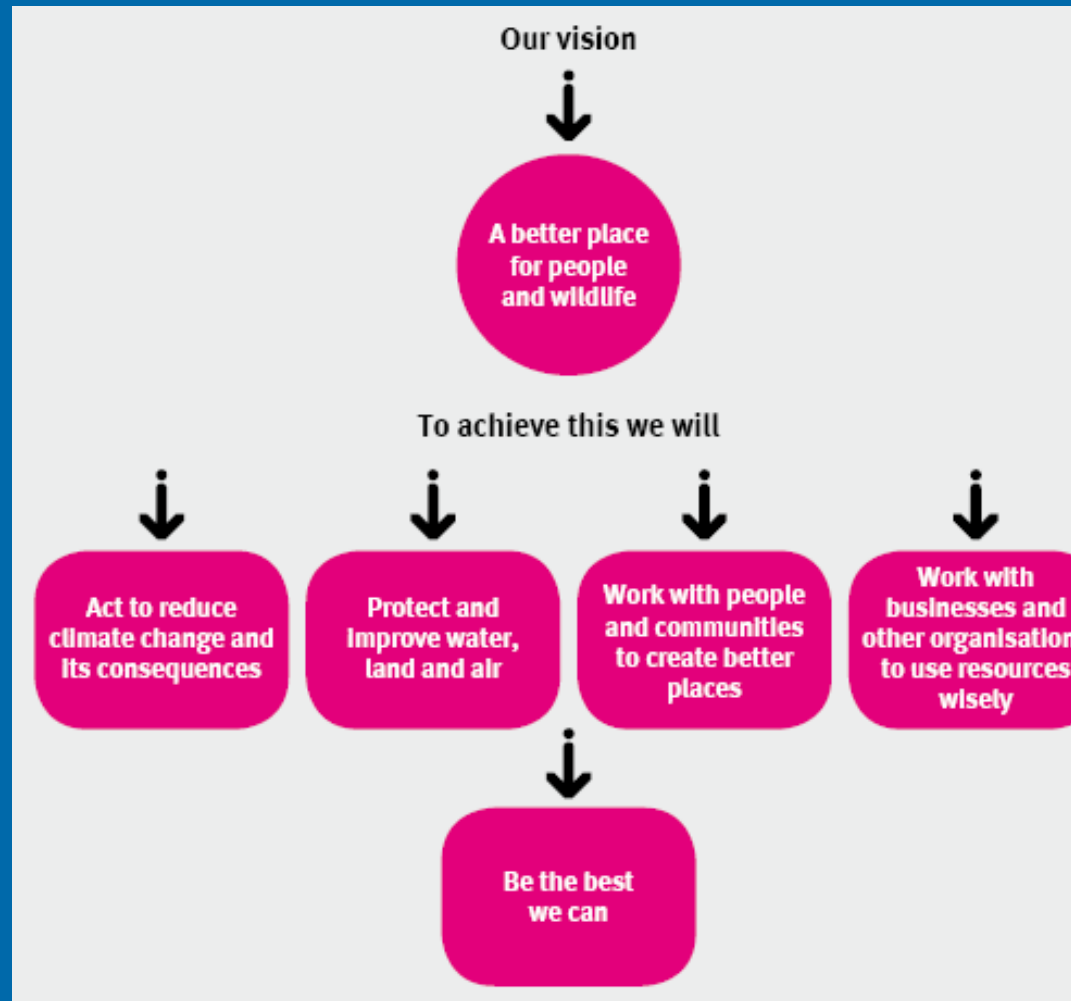
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BDA Seminar 16 Sept 2011

# Context

➔ The Environment Agency

➔ Our Corporate Strategy

➔ Importance of renewables



# Renewables we regulate

- ➔ Ground source heating & cooling
- ➔ Deep geothermal
- ➔ Anaerobic digestion (biogas)
- ➔ Biomass and biofuels
- ➔ Marine renewables (tidal and wave)
- ➔ Hydropower

# Our approach to renewables

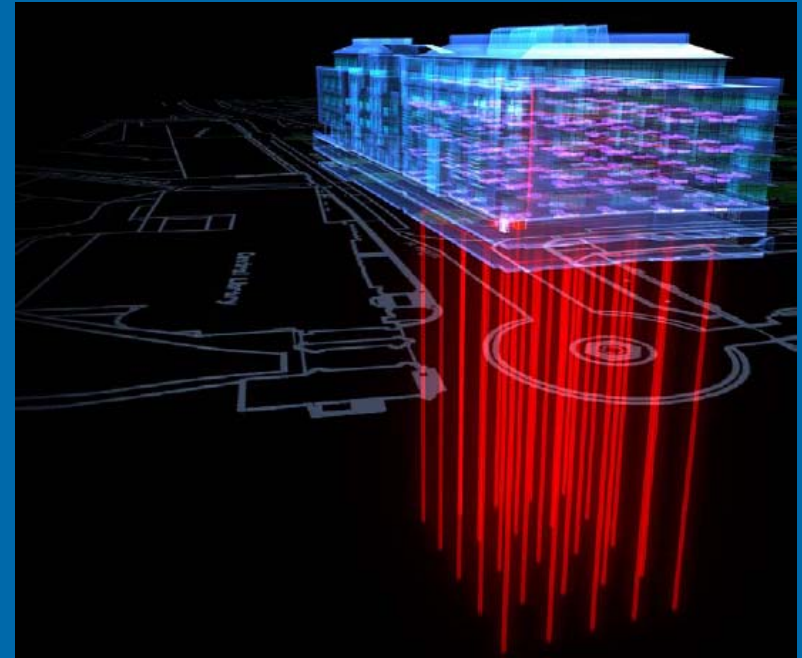
1. Better regulation of renewables
2. Technical evidence to support sustainable renewables
3. Deploying renewables on our own estate



Ground source heating and cooling pumps  
state of play and future trends

Resource efficiency programme  
Evidence Directorate

# EA new head office - Horizon House



# Regulation of ground source heat pumps

## ➔ Open loop

- ➔ Groundwater investigation consent

- ➔ Abstraction licence

- ➔ Discharge permit

## ➔ Closed loop

- ➔ We don't regulate

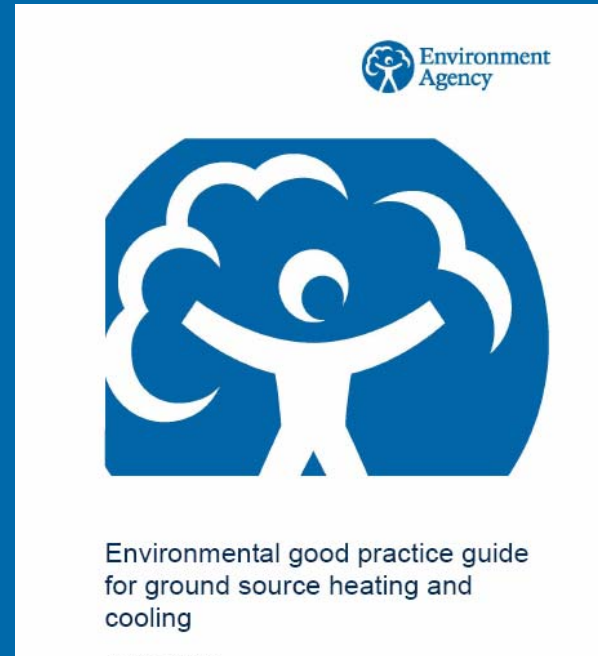


## Environmental good practice guide for ground source heating and cooling

# Environmental good practice guide

## Step by step approach:

- ➡ Location
- ➡ Geology
- ➡ Good practice – drilling, construction, installation & decommissioning



# Site Location

Table 2.1 Site checklist

Tick box		Check whether the proposed site is in these locations	Note number
Yes	No		
		Within a defined groundwater source protection zone 1 or within 50m from a well, spring or borehole used for potable supply?	1
		On land affected by contamination?	2
		Close <sup>1</sup> to a designated wetland site?	3
		Within 10m of a watercourse?	4
		Close <sup>1</sup> to other GSHC schemes?	5
		Adjacent to a septic tank or cesspit	6

# Geological checklist

Table 2.2 Geological checklist

Tick box		A geological checklist	Note Number
Yes	No		
		Is the proposed scheme in a principal aquifer?	1
		Is the proposed scheme likely to penetrate multiple aquifer horizons?	2
		Is the proposed scheme likely to go through contaminated soil, rock or water?	3
		Is the proposed scheme in an area with likely artesian conditions?	4
		Is the proposed scheme in a coal mining or unworked coal area?	5
		Is the proposed scheme in an area of significant evaporites or karstic conditions?	6

# Closed loop

**Siting of scheme (contaminated land, SPZ, water features)**

**Determine environmental impact of scheme**

**Assessment of geological conditions (multiple layers, artesian conditions)\***

**Ensure pipework integrity to prevent leaks**

**Pressure testing of scheme**

**Type of carrier fluid to be used**

**Operational monitoring of pressure in loop**

**Development of care and maintenance and emergency plan**

**Monitoring of temperatures**

**Determine long term sustainability of scheme – will include testing and possibly thermal modelling**

\*Only for a vertical scheme

# Open loop

Siting of scheme (contaminated land, SPZ, water features)

Determine environmental impact of scheme

Assessment of geological conditions

Development of care and maintenance and emergency plan

Monitoring volumes abstracted and discharged

Monitoring of temperatures

Testing recharge well

Test pumping to determine quality and quantity of water available

Determine and potential risk of flooding, impact on third party assets (subsidence/ movement)

Determine long term sustainability of scheme – will include testing and possibly thermal modelling

# Suitability mapping of open loop GSHPs

- ➔ Project with BGS
- ➔ 1:250,000 map England and Wales
- ➔ Hydrogeology
- ➔ Environmental factors

