



Environment
Agency

Managing Opportunities for Energy in the Groundwater Environment – A Regulator's Perspective

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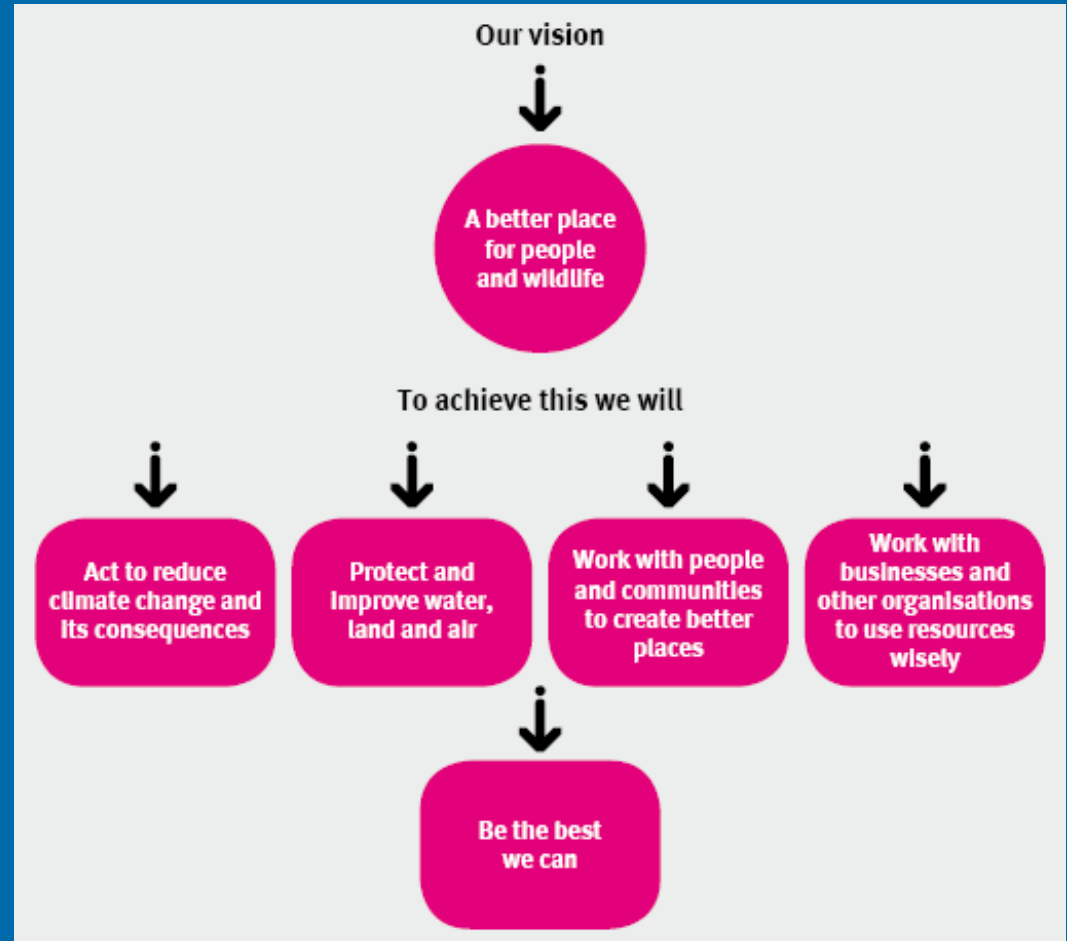
26th May 2010

Context

➔ The Environment Agency

➔ Our Corporate Strategy

➔ Importance of renewables



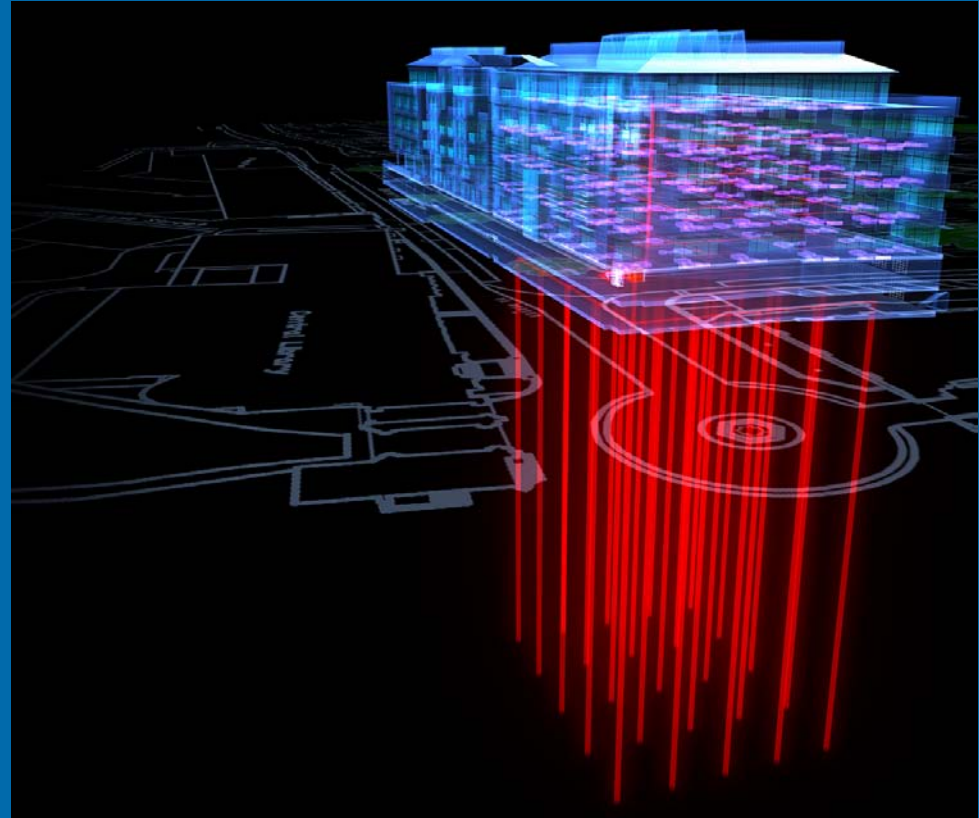
Our approach to renewables

- ➔ Better regulation of renewables
- ➔ Evidence and policy to support sustainable renewables
- ➔ Deploying renewables on our own estate



Horizon House

- ➔ 25 BHs 50-60m deep
- ➔ Both heating and cooling
- ➔ Provide 19% of total energy requirement
- ➔ Cost savings



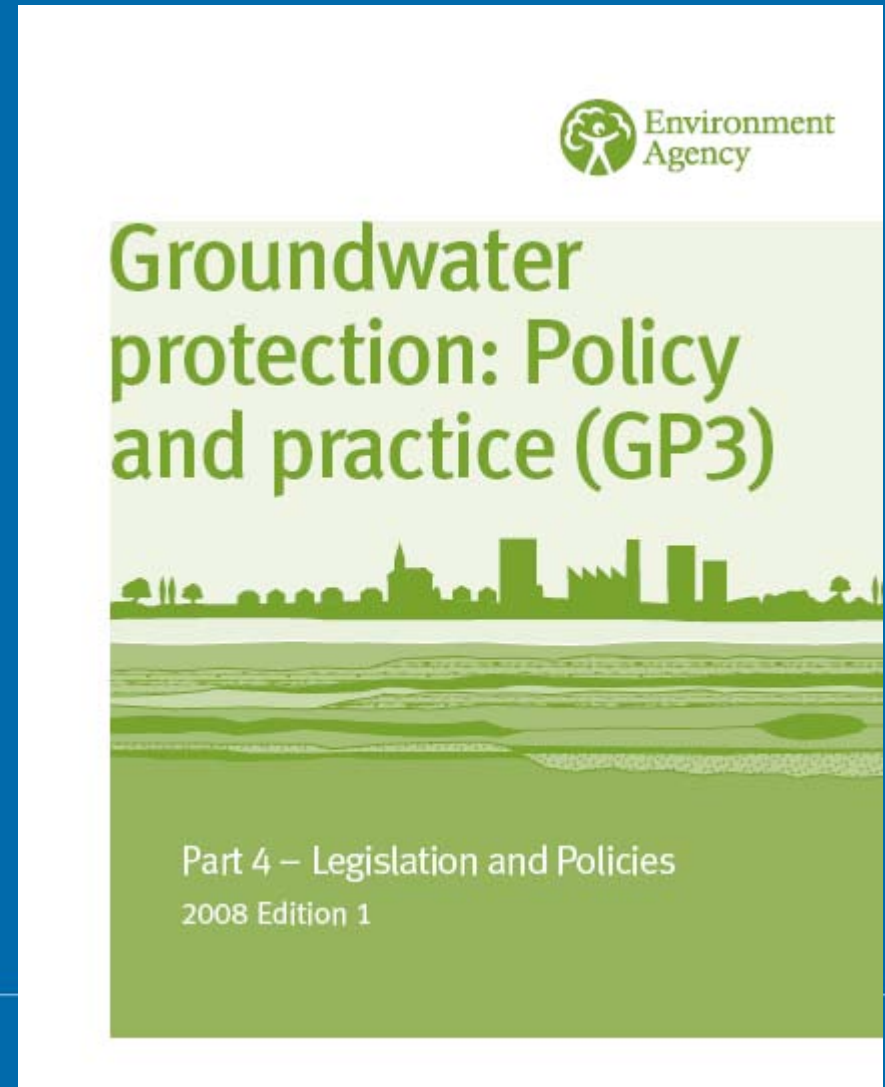
A satellite image of Earth showing the Americas. A large hurricane is visible in the Atlantic Ocean to the west of North America. The text is overlaid on a dark blue rectangular background in the upper right corner.

Climate Change Adaptation

Why do we need to adapt?

Importance of GW Protection

- ➔ Pollution prevention principles
 - ➔ Prevention better than cure - more important now than ever before?
 - ➔ Cost, ability to clean up, carbon impact of remediation/ treatment
- ➔ Protection of GWBs and groundwaters



Cost of Carbon

➔ Consideration of carbon impacts of our activities

➔ 32% our energy use in pumping

➔ Consideration of carbon impacts of activities we regulate



Adaptive approaches

- ➔ Sustainable Drainage Schemes
 - ➔ Considerable surface water quality, groundwater resources and flood benefits
 - ➔ Need to mitigate impacts of infiltration SuDS on groundwater quality





Water resource management does not start at the point of abstraction; it's about managing the catchment in its entirety.



Energy crops

➔ Biomass

- ➔ Potential impact on recharge
- ➔ Potential HER reduction 140 – 180 mm
- ➔ Further evidence needed on water resources impacts
- ➔ Energy crops scheme some controls on planting e.g. flooding area



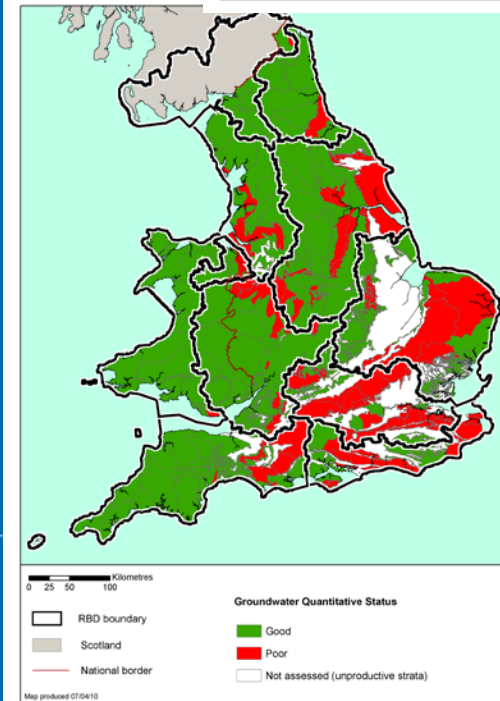
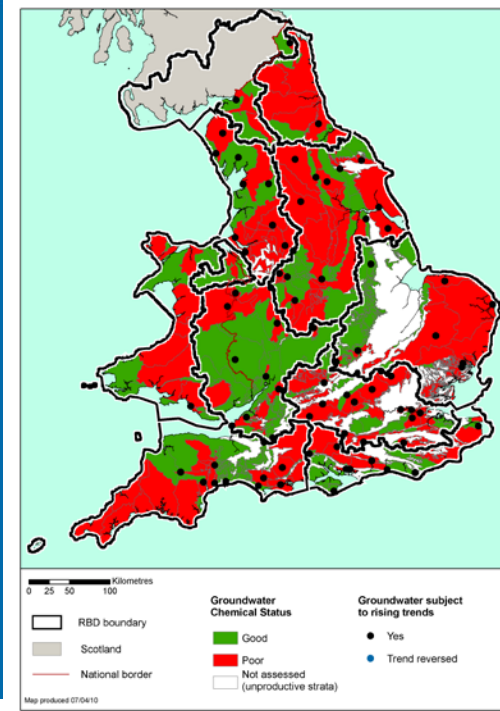
Deep activities - principles

➔ Groundwater bodies

➔ 3D delineation

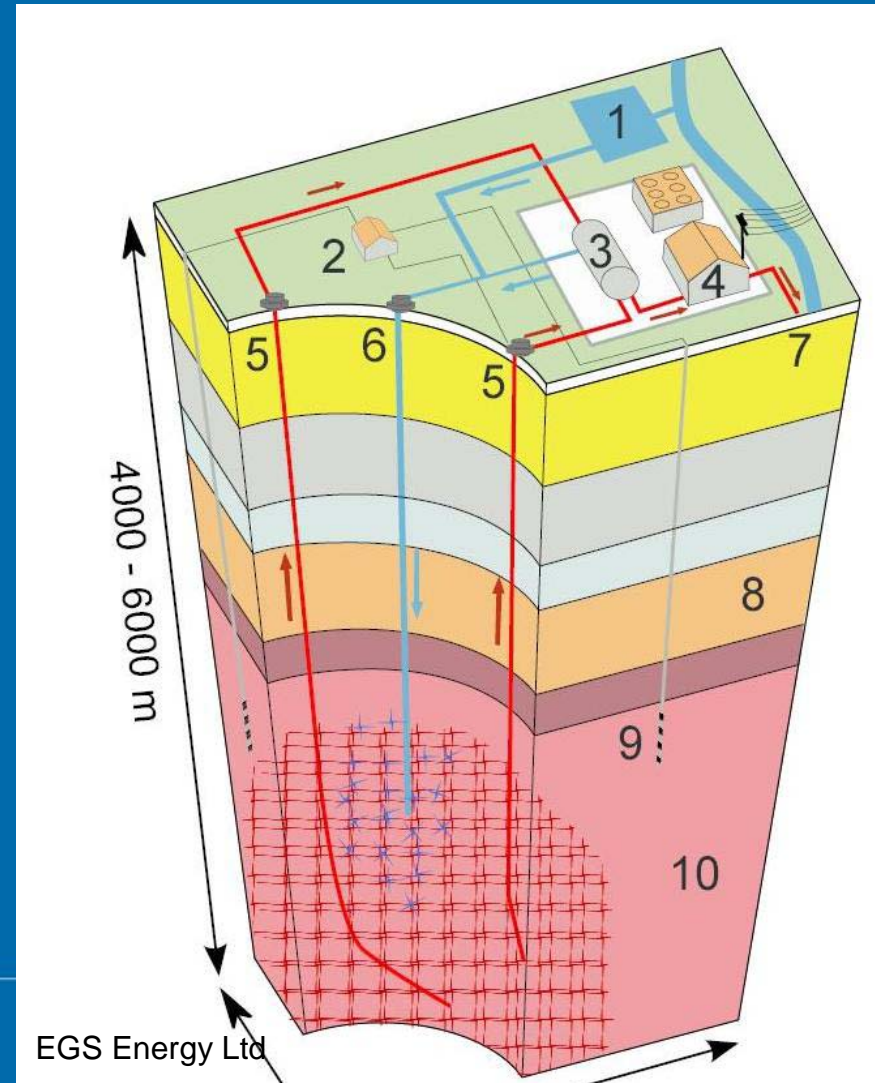
➔ Environmental Impact

➔ Risk based



Deep Geothermal

- ➔ No effective groundwater at depth
- ➔ Rocks artificially fractured
- ➔ Water introduced
- ➔ Re abstracted for heat/ energy generation



GSHP Growth

Total number of installations	8,000
Current installation rate (per annum)	4,000
Thermal capacity (MWth)	152
Energy produced (GWh)	489
Number of open loop systems	300
Number of dedicated cooling/heat and cool systems	500

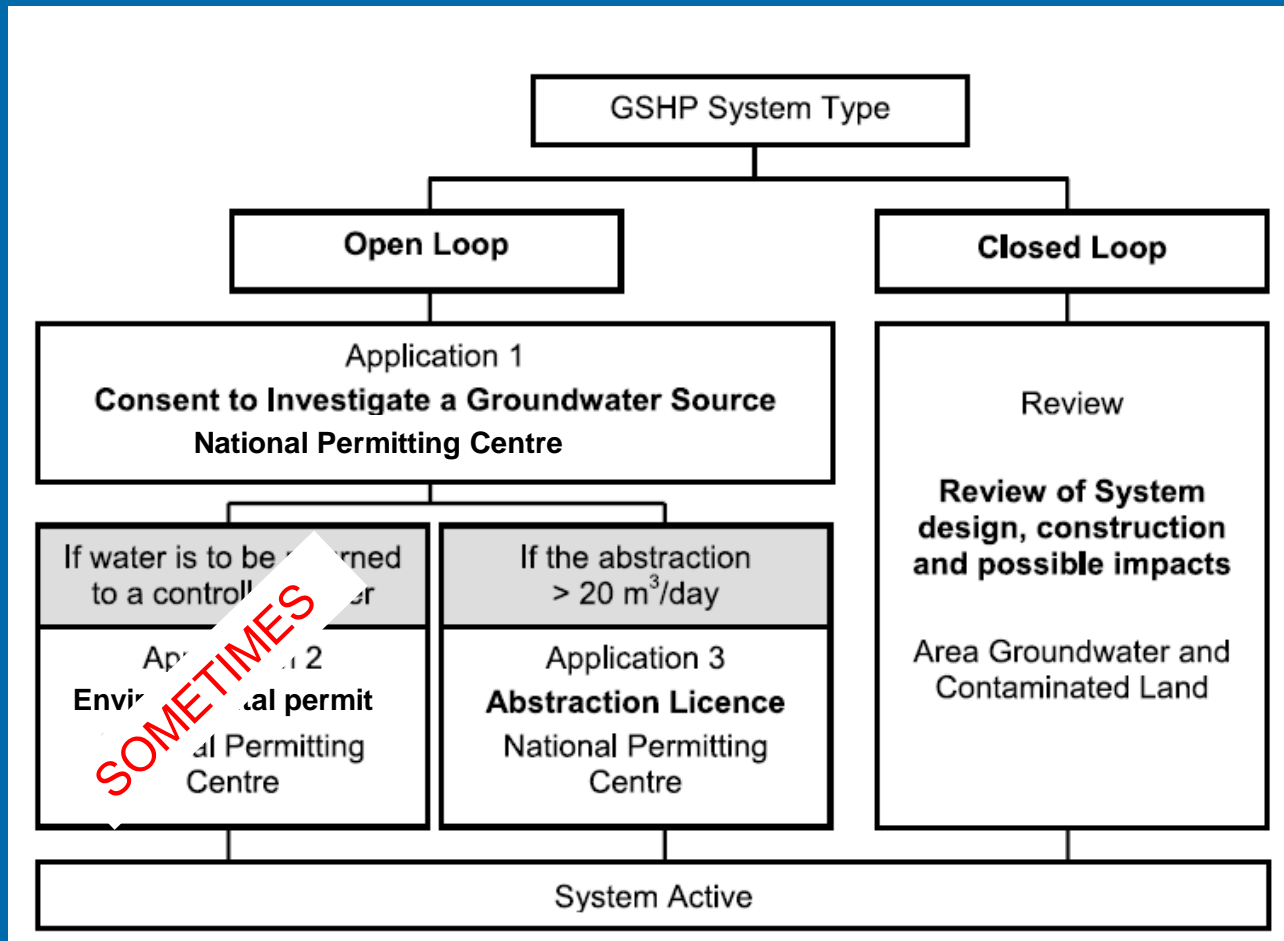
	Growth	High Growth
Total number of installations	320,000	1,200,000
Installation rate in 2019 (per annum)	40,000	400,000
Thermal capacity (MWth)	6,700	25,150
Energy produced (TWh)	21	78
Number of open loop systems	7,800	29,000
Installation rate in 2019 for open loop systems (per annum)	1,000	9,200

Our remit for 'heat' / 'coolth'

- ➔ We have no specific powers to control heat or coolth
- ➔ We can control pollutants (substances) to prevent pollution
- ➔ Heat or coolth are not substances
- ➔ But hot/ warm/ cold water are substances and so discharges can be permitted to protect the environment



Our role in Regulation



Modified from
Fry, 2009

Regulation

➔ Environmental Permitting Regulations, 2010

- ➔ Came into force 6th April 2010.

➔ No longer have discharge consents

➔ Four approaches:

- ➔ Bespoke environmental permits

- ➔ Standard environmental permits

- ➔ Registrations

- ➔ De-minimus

Our Activities

➔ GSHC Position Statement

➔ Groundwater Protection: Policy and Practice (GP3)

➔ To be consulted on this summer

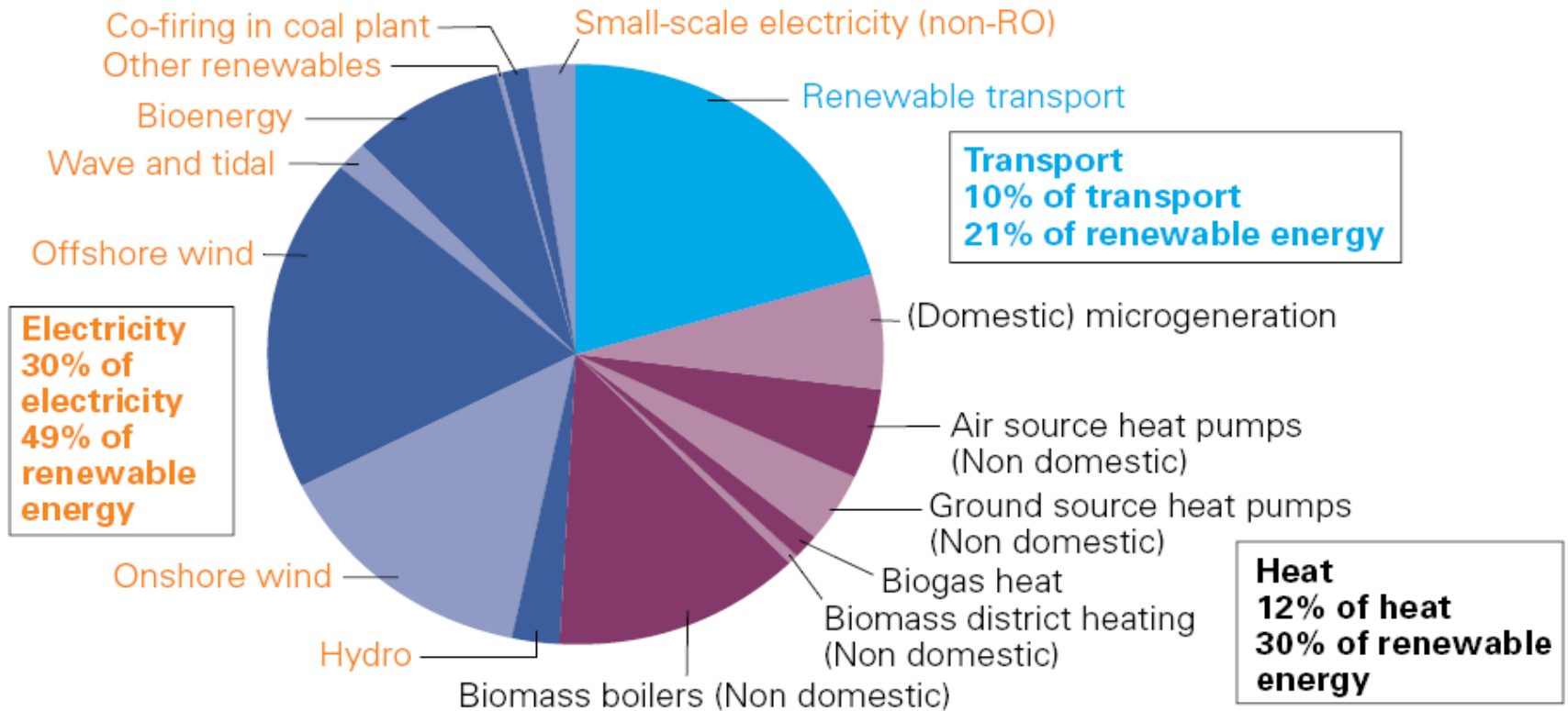
➔ Good Practice guide on GSHC

➔ Interim document this summer, comments until end 2010.

Our powers

- ➔ If we deem an activity could cause pollution we could serve a notice to prevent pollution of groundwater
 - ➔ we might prohibit the activity or use a notice to require the operator to apply for a permit
 - ➔ This may be appropriate to ensure hazardous substances are not used in SPZ1

Meeting the 2020 target



The Future

- ➔ Future needs mix of energy sources including renewables
- ➔ Need to make policy decision balancing climate change/ energy security and groundwater protection
- ➔ Decisions need to be risk based
- ➔ We need to ensure we are adopting better regulation principles
- ➔ Decisions need to be based on sound science and evidence