

Ground Source Heat Pump Association Webinar Series 2020

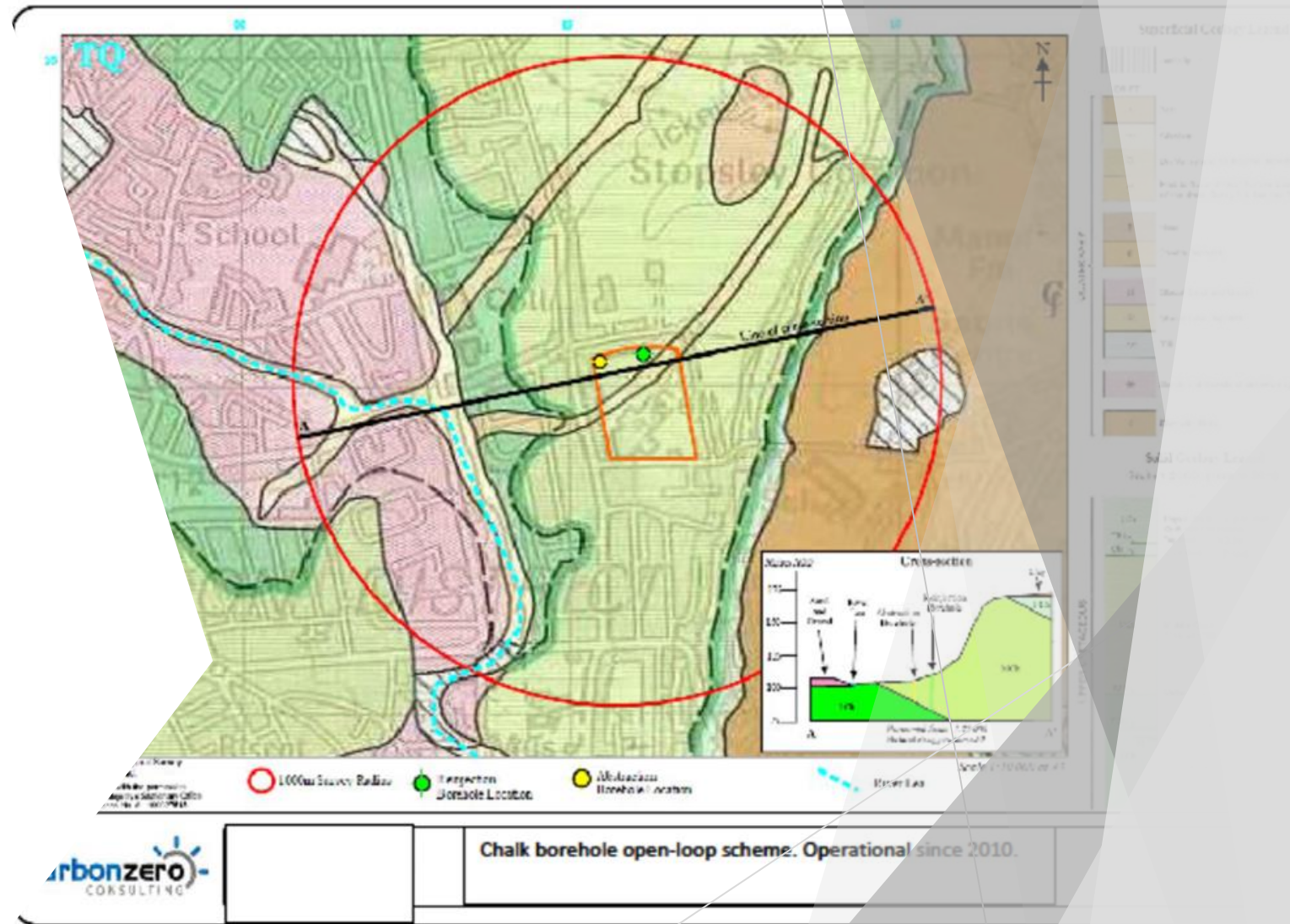
Open Loop Ground Source Systems

#1 – Setting the Scene

19th November 2020

Open Loop Ground Source Systems #1 - Setting the Scene

- ▶ Open Loop vs Closed Loop
- ▶ System Geometry
- ▶ So, How Much Water Do We Need?
- ▶ ...and How Much Water Is Available?
- ▶ Space & Separation Requirements
- ▶ Next Steps



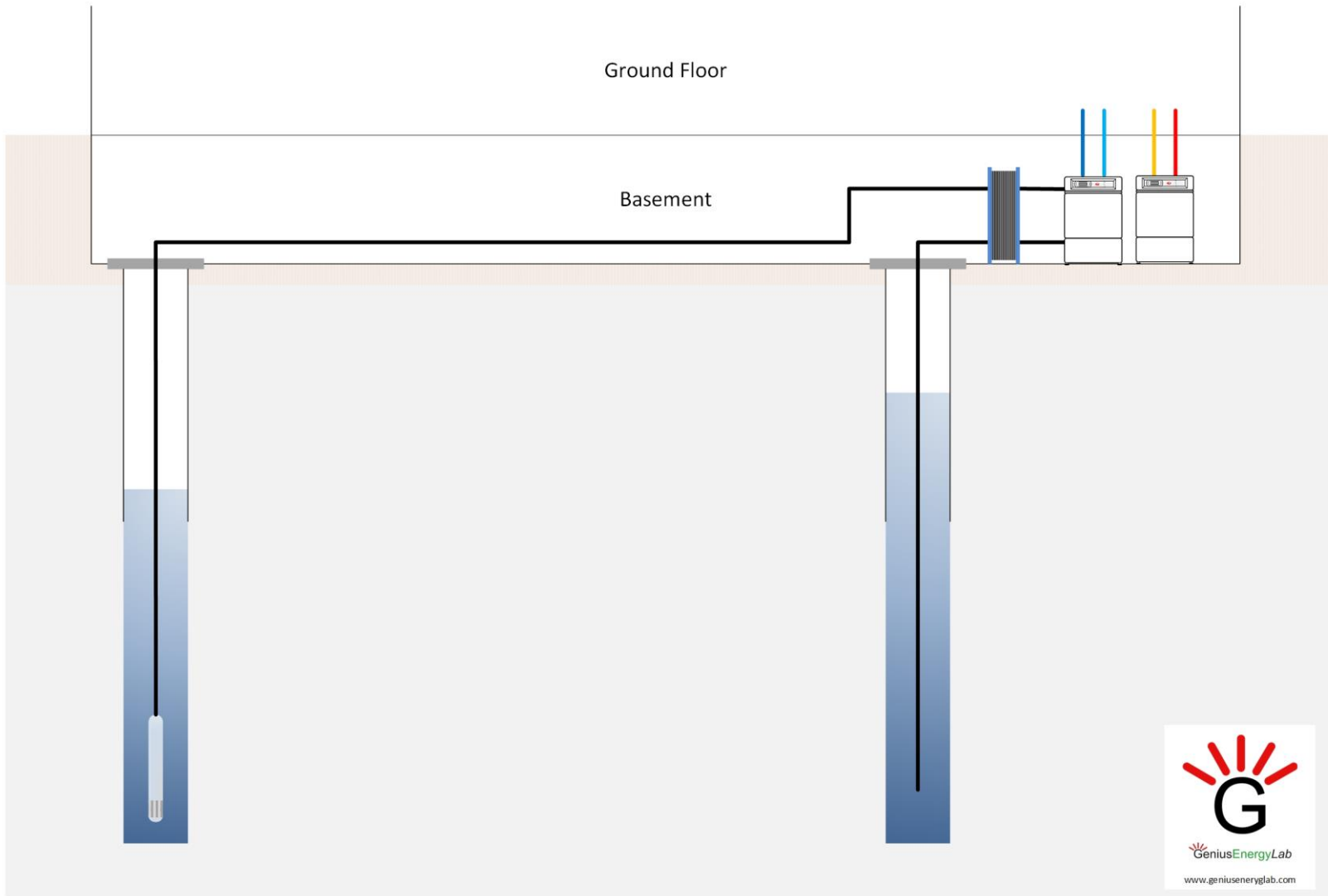
Open Loop vs Closed Loop

Open Loop

- ▼ Inherent Risks
- ▼ Licencing Requirements
- ▼ Longer Lead Time to Start on Site
- ▼ Higher Ongoing Maintenance
- ▲ Simpler Design
- ▲ Less Space Generally Required
- ▲ Generally Lower Installed Cost
- Can be More Efficient

Closed Loop

- ▲ Lower Risk Solution
- ▲ Best Practice & Standards Only
- ▲ Start On Site Quickly
- ▲ Lower Maintenance Requirements
- ▼ Specialist Design Required
- ▼ More Space Hungry Solution
- ▼ Often More Expensive
- Can be More Efficient



So, How Much Water Do We Need?

- ▶ It depends on,
 - ▶ What your peak heating and cooling loads are
 - ▶ How efficient your heat pumps are
 - ▶ What the ground water temperature is & how much we can change it by
 - ▶ The natural properties of water & the Laws of Physics!


$$\text{Heating Peak Flow} = \frac{\text{Peak Load} \times \frac{\text{COP} - 1}{\text{COP}}}{4.2 \times \text{Delta T}}$$

$$\text{Cooling Peak Flow} = \frac{\text{Peak Load} \times \frac{\text{COP}}{\text{COP} - 1}}{4.2 \times \text{Delta T}}$$

...and How Much Water Is Available?

- ▶ Online Information is Available
- ▶ but Hydrogeology is a Science
- ▶ Many major and varied regional aquifers in UK
- ▶ Many more smaller aquifers
- ▶ BGS and other Water Well Prognosis Reports
- ▶ Specialist advice essential to develop designs
- ▶ It's easier (and cheaper) to get specialist help than you think!
- ▶ Please, Please, Please Don't DIY!



The background of the slide features a dark, industrial scene. On the left, there are two circular gauges with white faces and black markings, mounted on a dark metal panel. To the right, a large, teal-colored mechanical component, possibly a valve or part of a pump, is visible. The overall lighting is dim, with some highlights on the machinery. The text is overlaid on a dark, semi-transparent rectangular area in the center-right of the image.

Space & Separation Requirements

So we have decided an open loop is viable for our project, what next?

- ▶ Engage a specialist!
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- ▶ Viability, outline borehole and system design
- ▶ Commence the licencing process via an EA Pre-Application
- ▶ Run in parallel with Detailed Design
- ▶ Employ contractors and get drilling
- ▶ Test-pumping to Environment Agency requirements
- ▶ Remember the EA process, post-drilling, can take up to 5 months
- ▶ ...and did I say Engage a specialist?

Questions.....

and thank you
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