

## **Overview of Ambient Loop District Heating Feasibility Study**

The main focus of the Study has been the Ambient Loop design for retrofitting heating for existing houses, described well in the Town Rock Energy Report (TRE). However this design proved expensive at the budget stage and another five configurations/scenarios were designed and costed. The results are shown in the Comparison of Scenarios Table.

Our conclusion was to settle on a two-loop system with boosted temperature loop heat for the Field of Dreams area of 44 houses and single closed loop wells for 21 houses in the Bagend/Barrels/Soillse area. The temperature boosting for the 44-house system will come from a GSHP in the Pump House. Boosting the two loops in the temperature range 11C to 20C, increase the house GSHP COPs. Maps are shown in the TRE Reports. This 21-house area lends itself to our approach as all the houses are close to open and forest-land, which is suitable for single closed loops wells.

For comparison of scenarios, we chose to run discounted cash flow calculations – IRR and NPV. For the IRR calculations, we chose to use the investment as the CAPEX difference between ASHPs and GSHPs. The IRR is then an evaluation of the extra cost of the GSHP investment, with revenues being the difference in COP values between ASHPs and GSGPs. It will be seen that IRR and NPV numbers support our 44, 21 and 65 house scenarios.

A main driver of the Study is the elimination of fossil fuels for heating. Evaluated are the carbon savings from running GSHPs vs. ASHPs and also vs. LPG, as the main current heating fuel. In addition the embedded energy of the chosen scenario was calculated. All these numbers are given in the Scenarios Table.

We explored the possibility of providing ground source heat from closed loop wells in the open area next to the Field of Dreams. The TRE report on this indicates that 27 wells 200m deep would work. On the project being funded, an exploratory well will be sunk to evaluate the underground potential. If shallower closed loop wells are adequate, this may be our preferred option for the Field of Dreams.

Proposals for controls and optimisation are from consultants Pragmatic Energy (David Kane) and the scoping is included.

### **Here are the links for the documents supporting this Report:**

2. [Scenarios Comparisons](#)
3. [Booted Loop Embedded Energy Calculations](#)
4. [Boosted Temperature Loops & Pump Station for 44 houses](#)
5. [GSHPs with closed loop wells for 21 houses](#)
6. [2023-21-04 TRE Findhorn Ambient Loop Fv1](#)
7. [TRE Findhorn Closed Loop Borehole Assessment](#)
8. [Pragmatic Energy Scope 27-4-23](#)