Heat Pumps in high rise buildings
Research and Development Center
Manufacturing facility | Training center | Competence headquarter
To passive house or not to passive house

✓ Do BCC want passive houses, if so why?
✓ What is the driving force behind the desire to go passive
✓ What are you expecting from passive.
✓ Do you understand passive?
HEAT LOSS BELOW 10W/M2 New build today have 30/35w/m² heat losses so how much will it cost to reduce the fabric by two thirds.

AIR TIGHTNESS. Must be below 0.6 air changes per hour. Mechanical heat recovery will be required to input air to the house on a constant basis.

Thermal comfort must be met for all living areas during winter and summer, with not more than 10% or the hours in a given year over 25deg.

Windows to achieve 0.80w/m²k u value
Tenant interaction

 ✓ A passive house relies on passive habitants
Heat interface system

- Overheating in summer
- Distribution heat loss up to £3000 per year
- CO₂
- Running 24/7 to landlords expense
- Metering. Billing platform
- Heat loss over the course of the pipe work
- Continuous pumping cycle
Heat interface unit

Billing Company £12 Per Month

Pay As You Go Meter For Resident

Flow Meter

60°

50°

DHW Cylinder

Radiators
District external plant room

Billing Platform For Landlords Expense

Additional Cost For Meter Installation

120kw G.S.H.P

Borefield
Ground Heat System

- No billing platform for landlords required
- No billing platform for residents required
- No flow meters required
- No district external plant room
- No continuous 24 hours pumping cycle
- No distribution heat loss
Ground Heat System

- Stand alone units
- No billing platforms
- 1x Borefield
- 1x Pumping Duty
- 10 °C through the risers
Ground Heat System

- Stand alone SMS ground source heat pump provides space heating and domestic hot water
- No billing platforms required
- Available for non-domestic RHI per apartment
Each property will have its own GSHP and DHW cylinder. All within a small footprint of 700mm (W) x 700mm (D) x 2000mm (H).

The heat pump will then supply new oversized radiators and domestic hot water.

Co-axial communal borefield
Edinburgh Grasmarket

1) Building 1980s
2) 18 Flats 54 inhabitants
3) Underfloor heating
4) Double glazing

Heating sys. renovation Nov. 2019 55 kW airsource heat pump split model because of sound regs. in old town centre.
Edinburgh Grasmarket
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Edinburgh Grasmarket
Luft Split 55 kW
Edinburgh Grasmarket
Air Monoblock 60 kW
Manchester Tower 1960s
100 flats in total

1) 16 Story building
2) Hight 48 meters
3) Build material steel / concrete
4) Old windows
5) Poor insulation
6) Electric showers
7) Electric storage radiators
8) Inhabitants ca. 120-180 persons.
9) Heating cost past: 700-1100 pound
10) Heating today: 140-340 pound incl. hot water
Flats renovation
Unit pre-production Austria
Flat layout
Space saving bore field
Patented high strength, lightweight fiberglass casing presents the lowest thermal resistance and pressure drop of any system commercially available. It is the proven leader of performance.

Nylon reinforced EDPM center flow channel provides thermal separation between the two fluid streams minimizing thermal crosstalk. Outer ridges provide convective heat transfer.
Sulford Manchester 138 flats

1) 18 Story building
2) Height 48 meters
3) Build material steel / concrete
4) Double glazing
5) New insulation
6) Gas combi boilers replaced
7) New low temp radiators installed
8) Inhabitants ca. 150-200 persons.
9) Heating cost past: 700-1100 pounds
10) Heating cost now: 100-300 pounds
Unit production UK Ground Heat

1) 1400-1000 units per year
2) 2120 liter hot water
3) Leck test before delivery to site
4) Function test on own test bed 100 % quality control
Tower before / after UK
Special bore probe reduction
Of bores up to 60% less drilling
Thank you for your kind attention