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Daly

The Decarbonisation of Heat

By Ryan Daly
Director of Renewables at Daly & b4b Renewables

Agenda

Introduction

NI: A Green Economy

Why Geothermal

Domestic Case Studies

Commercial Case Studies

Role of Designers

Sector Collaboration

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Ryan Daly

Founder of Daly Renewables which has grown to be one of Northern Ireland's leading companies in the design and installation of renewable energy systems.

2000 – 2004
Ulster University
BEng (Hons),
Environmental
Engineering 1:1

2002 – 2003
VMRA Design
Consultancy (Dublin)

2020 - 04

2004 – 2006
Vaughan Engineering
M&E Contractor

2004 - 06

2007 – 2010
Scoffields
Responsible for renewables designing, installing and commissioning

2007 - 10

2010 –
Founded Daly Renewables - largest heat pump installer in NI

2010 Present

2024
b4b Renewables bring strength to the commercial sector. Major player in energy and sustainability

2024

Director of Daly & B4b Renewables

MCS CERTIFIED

RECC RENEWABLE ENERGY CONSUMER CODE

GSHPA GROUND SOURCE HEAT PUMP ASSOCIATION

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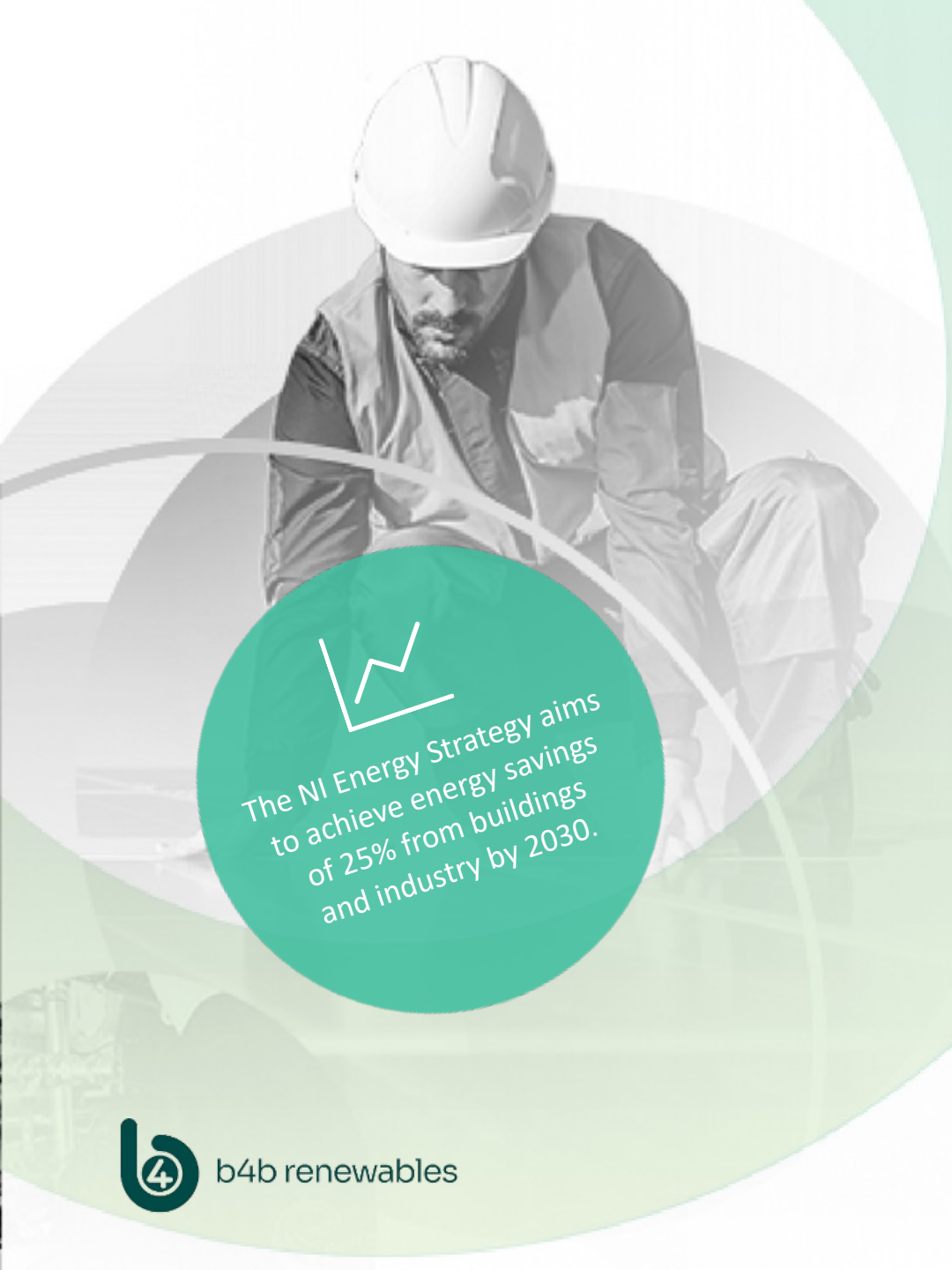

NI: A Green Economy

- For the year ending March 2024 - **45.4% of total electricity consumption** in Northern Ireland is generated from renewable sources located in Northern Ireland.*
- Energy Strategy 'Path to Net Zero Energy' and the Climate Change Act target is to ensure **that at least 80% of electricity consumption In NI** is from renewable sources by 2030.
- In ROI The Sustainable Energy Authority of Ireland (SEAI) have a Grant Scheme for "One-Stop Shop Service" for retrofitting Heat Pumps to domestic properties.
- In GB (England, Scotland, Wales) Home Upgrade Grant (HUG), Local Authority Delivery Schemes (LAD) and the Energy Company Obligation (ECO) schemes - which are all geared to help with energy efficiency, heating and renewable energy in homes.
- NO COMPARABLE SCHEMES FOR DOMESTIC PROPERTIES IN NI

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** STATS from the DfE NI*

Our Earth: use it, don't abuse it

BENEFITS:
- Local Source
- Always available - regardless of the weather
- Low spatial footprint
- Scalable

IDEAL FOR:
- Single Dwellings
- Groups of Buildings
- Commercial Premises

Geologically, Northern Ireland is ideal for Geothermal energy, with temperatures ranging from 10-20c on Shallow applications (2+ m depth) - ideal for heating and cooling using heat pumps.

Geothermal energy has the potential to form part renewable heating solution in Northern Ireland.

Randalstown Communal GSHP
System 80% of the heat and hot water requirement of the building comes from the Earth below

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Why Geothermal

Advantages of Geothermal

- No CO2 emissions
- Renewable energy source
- Reliable equipment
- All in one system, heating, cooling and DHW
- Low maintenance and low cost

Since 2007 we have numerous GSHP systems installed in NI which have had zero maintenance issues

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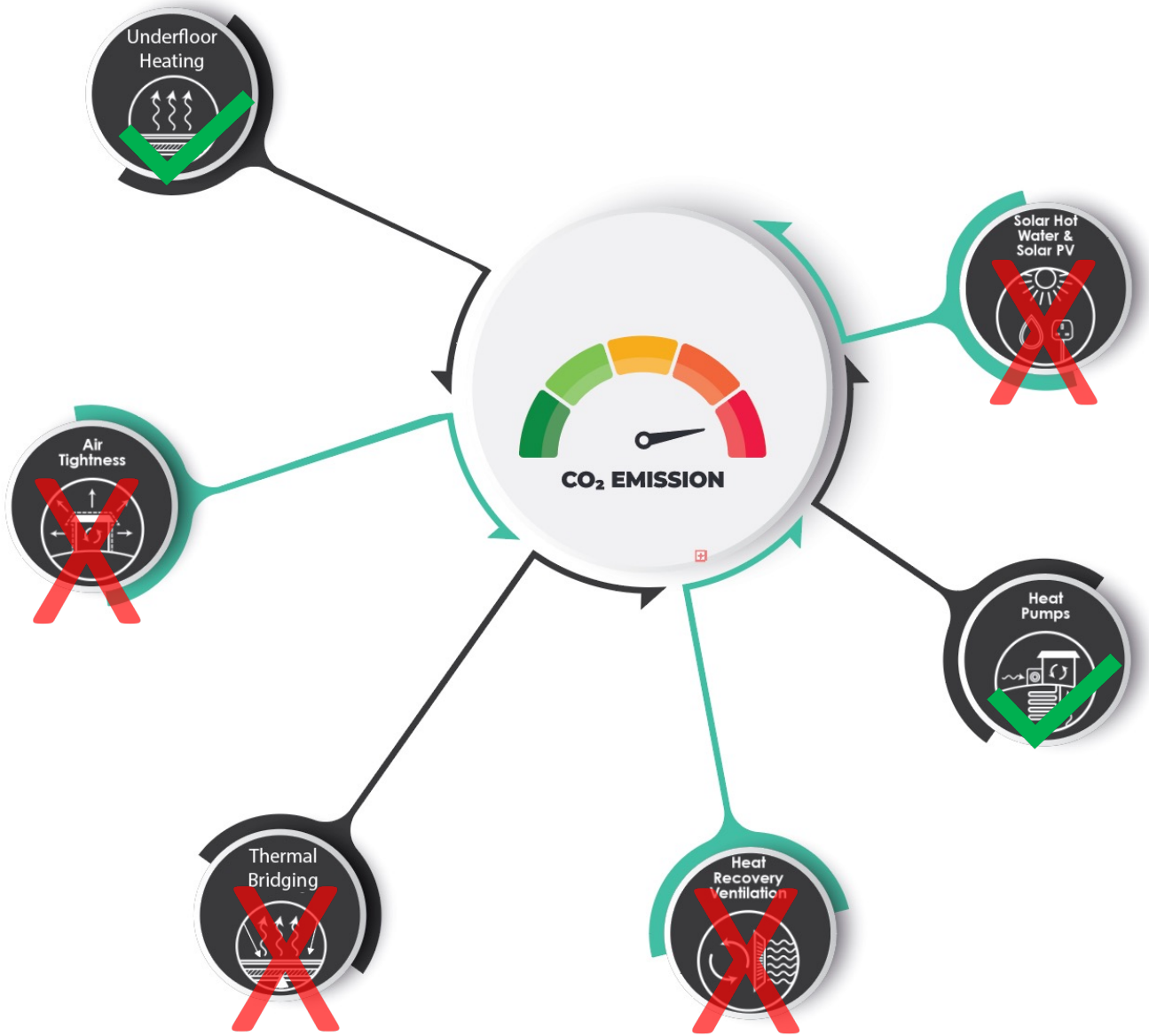
Case study 1 –New build, Hilltown Co,Down



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Case Study 1

2,700sqft 1 ½ story bungalow built in 2005

Issues:

- GSHP Running “all the time” (approx. 17hrs/day on a Winter’s Day)
- Over extraction of energy from the ground (ice around pipes)
- Dissatisfied Client

Solutions:

- Additional GSHP Pipe fitted
- Engineer Visit from Manufacturer
- House insulation reviewed and improved
- Improved system performance
- Reduced running costs
- **System still performing, 18 years later**

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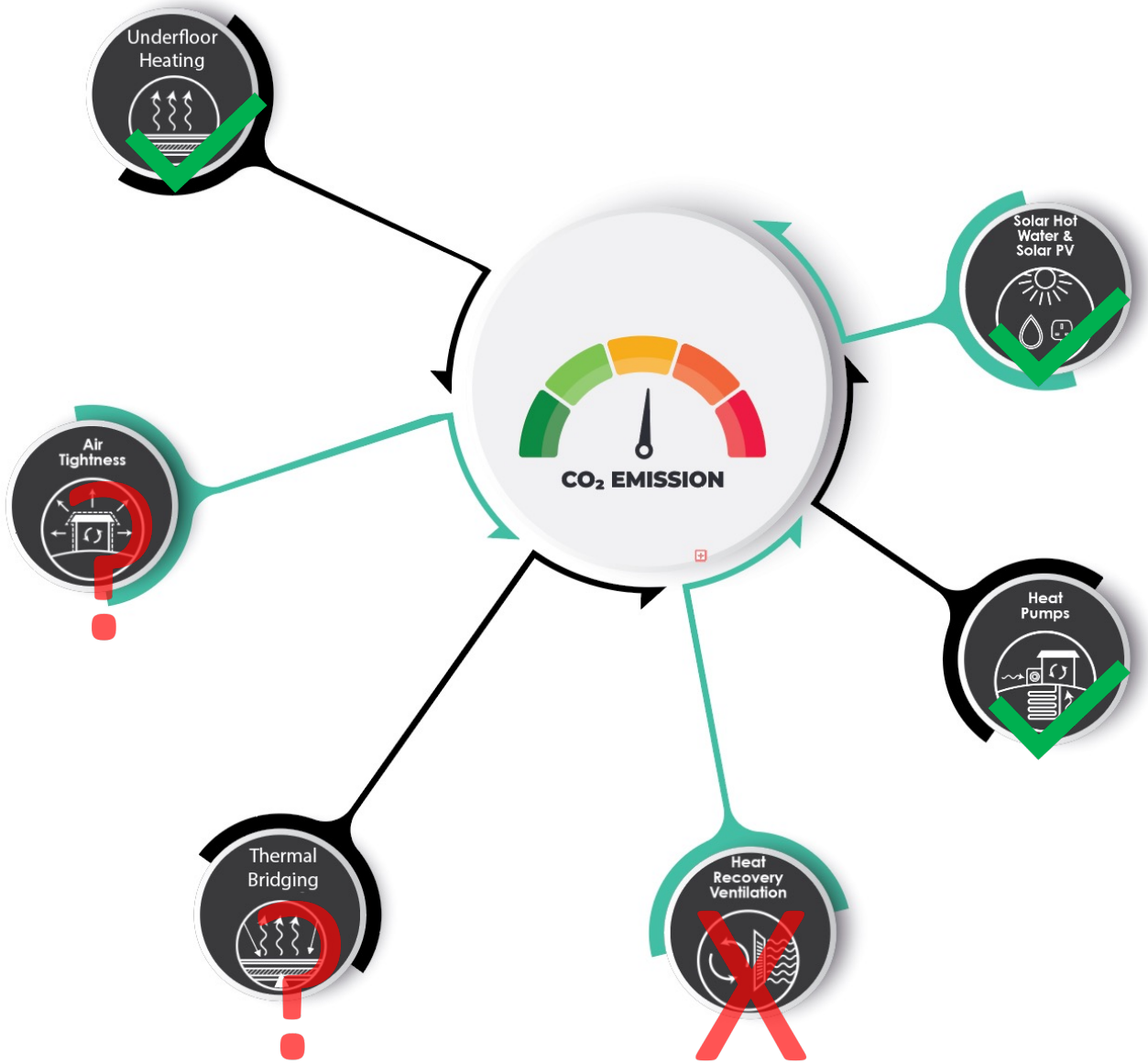
Case study 2 – Retrofit Dromara, Co,Down



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Case Study 2

3,300sqft bungalow built in 2007

Issues:

- Oversized Oil Boiler (45kW)
- High Running Costs
- House uncomfortable – too hot or too cold
- Timeclock for Heating & Hot Water Control
- Boiler unreliable
- Mixture of UF heating & Standard sized Rads in property
- **Running cost £3,500.00 per year**

Solutions:

- 12kw GSHP retrofitted
- 600m Geothermal Pipe
- 4kW Solar PV
- Weather compensation controls
- House comfort level improved
- **CO2 reduction – 8930kg per year**
- **Running Cost £1,600.00 per year**

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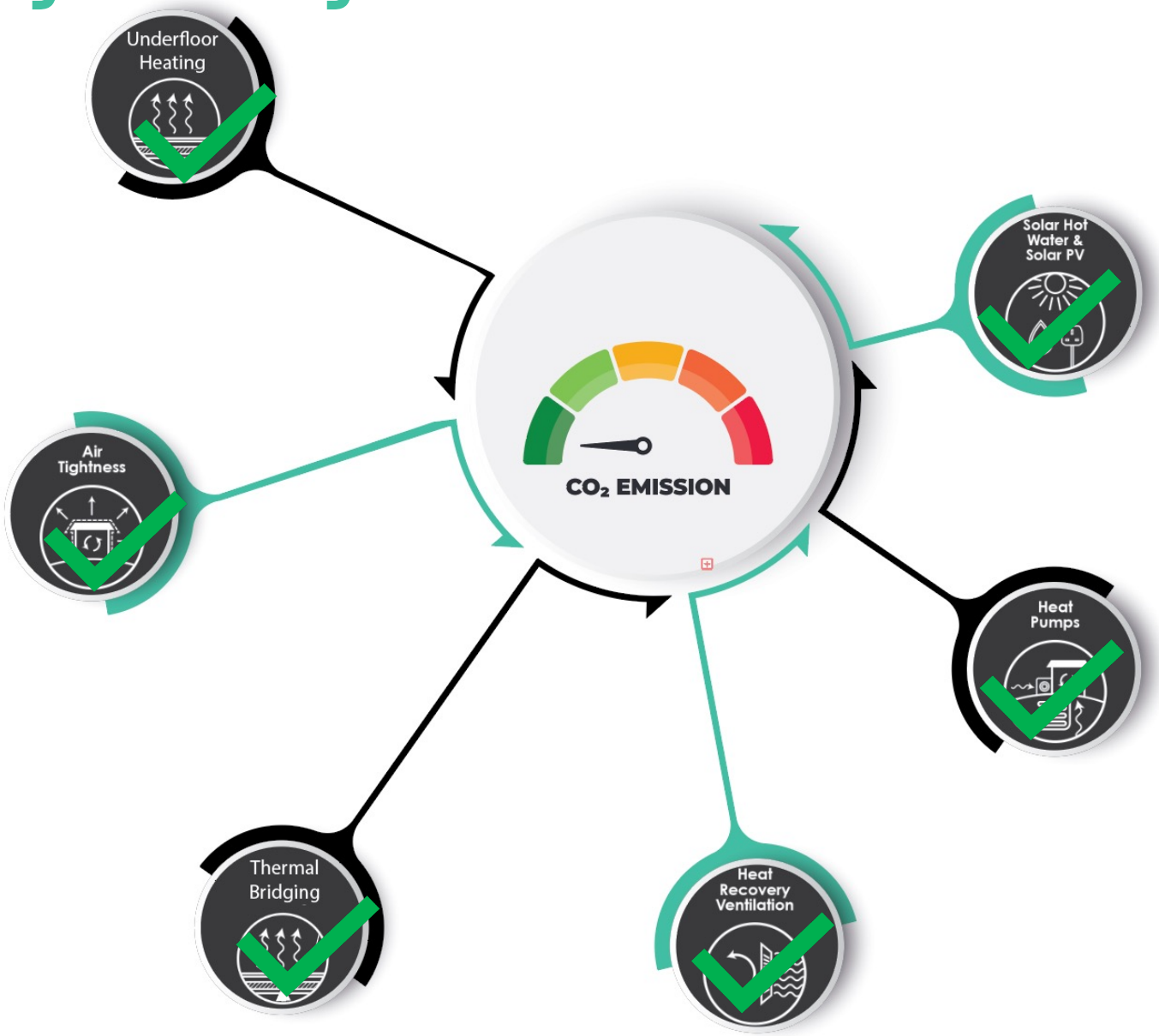
Case study 3 – Daly Selfbuild



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Case Study 3

Eco-Friendly Family Home in Lisburn

Highly efficient home with efficiency and sustainability considered at design and planning phase.

Architect was provided a clear 2-page brief on house design plus integration of renewables. Clear requirements on mechanical function and how they operate in synergy.

Annual costs

£132 – hot water, heating and cooling

£600 – Total energy bill

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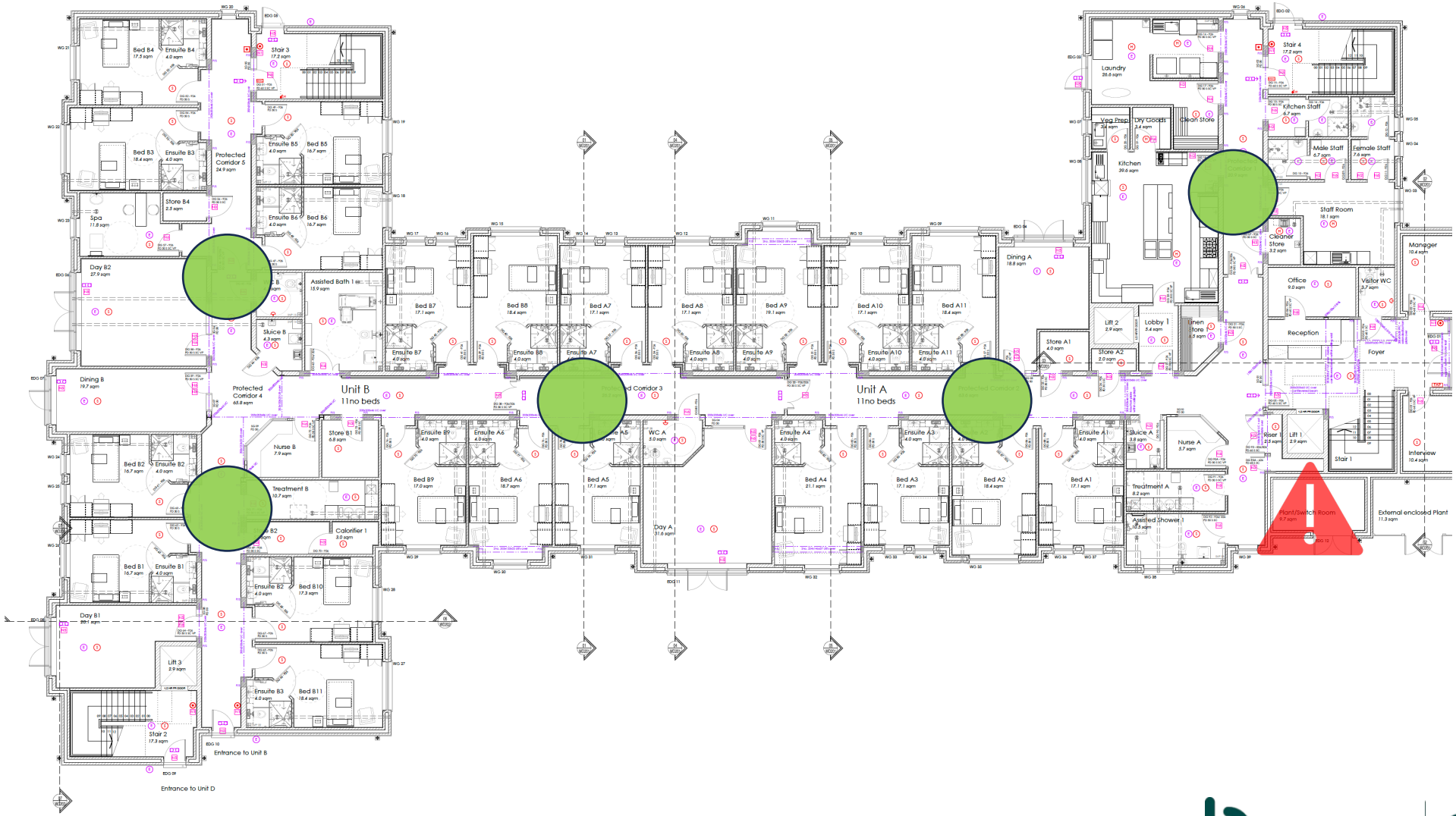
Role of Designers



Ground Floor Plan

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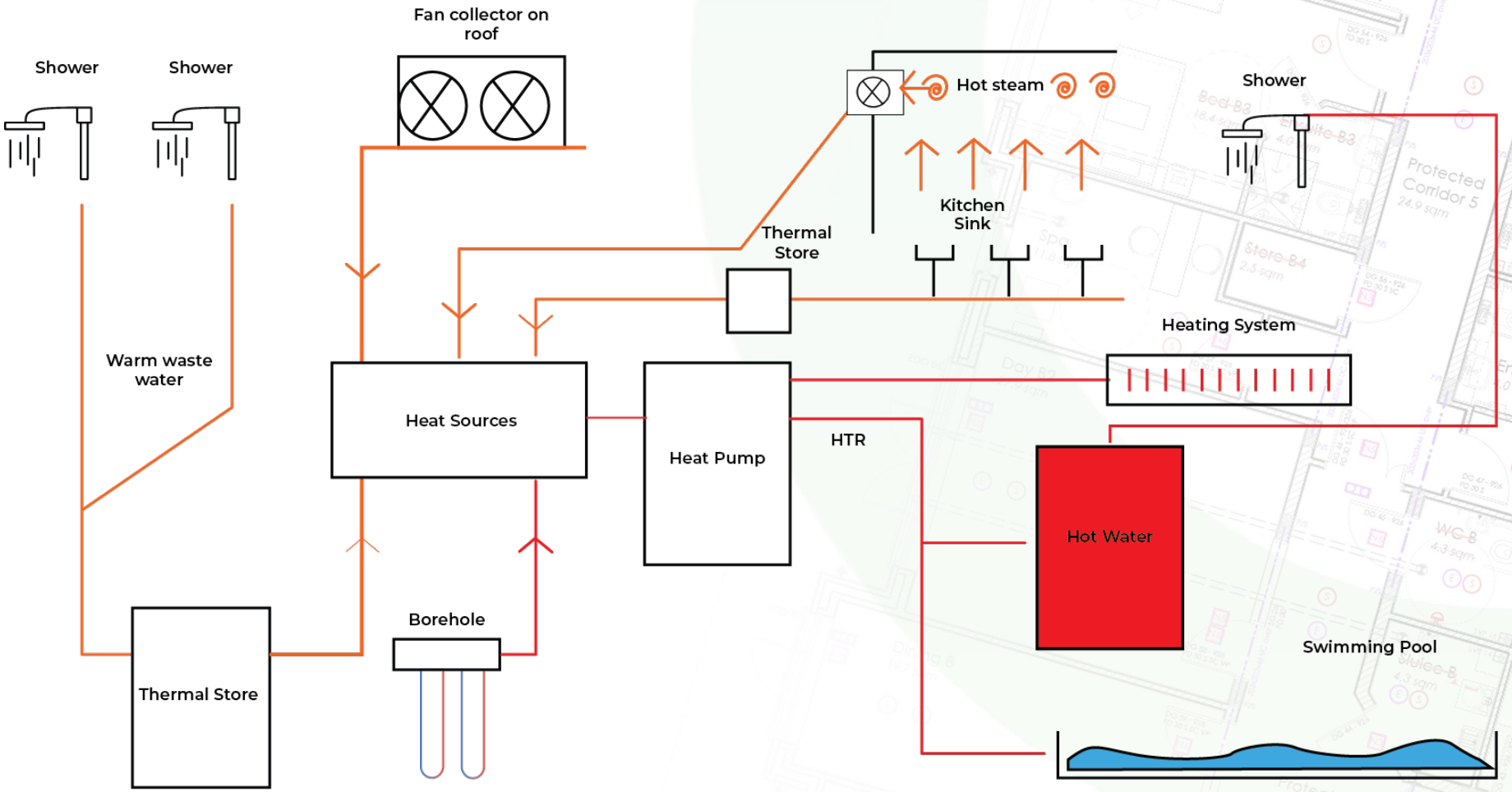
Role of Designers

Nursing homes and hotels



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Case Study

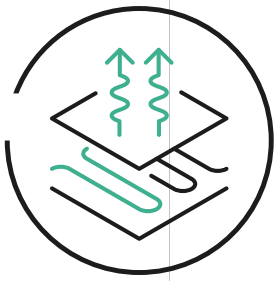
Portadown Community Treatment and Care Centre (CTCC)

Issues

- Using System to “dry out” building
- System running 24/7 with all doors open – therefore, could not achieve temperature

Key Learnings

Awareness of system capabilities



GSHP systems and building fabric are inextricably linked

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Case Study

Communal Geothermal Heating System In Randalstown

The client, Rural Housing Association, appointed us to design and implement a communal Geothermal Ground Source Heat Pump System to benefit nine apartments within a social housing scheme in Randalstown, Co. Antrim.

Key system features

- 2 x Ecoforest 22kw GSHP's linked to 6 x 140m boreholes
- UFH, MHRV & 250L Cyl in each apartment
- System COP 24/1/24 – 4.8
- DHW – 58 Degrees
- Hot Water heated by HTR
- Daly input to design – Eg. Local HIU units replaced by 2 x heat meters in each apartment
- Simplified Controls
- **£13/week** running cost for apartment owners for all heating & hot water.

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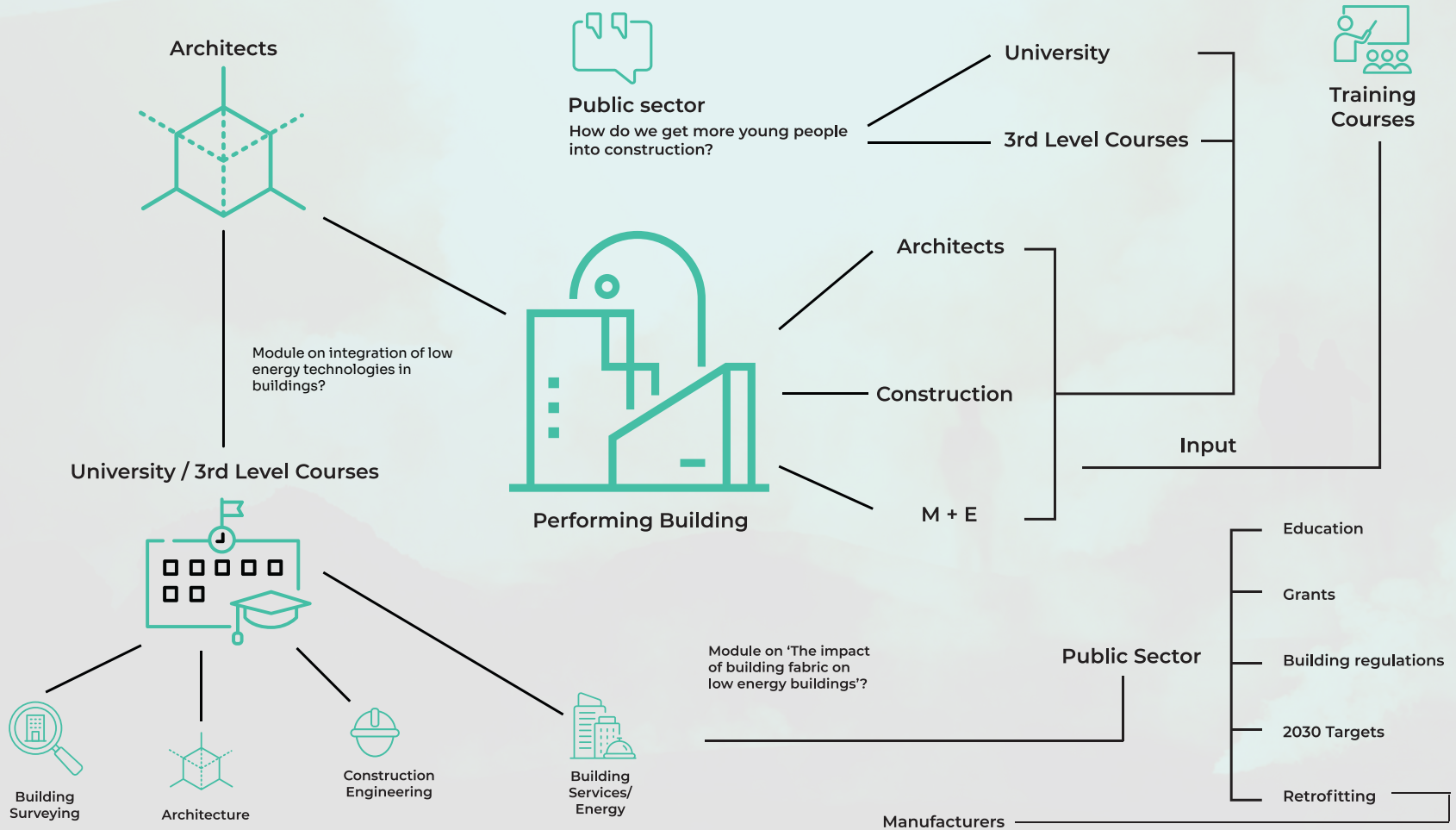
Collaborating with our Sectors



Skills

Funding

Partnerships

Education

Design

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[Rural Housing Geothermal Video - Youtube]

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Thank You

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