

**WREN URBAN NEST**

**LUXURY WITHOUT  
THE GUILT**

**BDP.**



[www.wrenhotel.ie](http://www.wrenhotel.ie)

Patrick Kavanagh



Engineering Associate with **BDP**.  
Chartered Engineer

- BREEAM AP
- LEED GA
- WELL AP
- BER Assessor
- DEC Assessor
- SEAI Energy Auditor
- TUD External Examiner



# BDP.

**BDP** is an International multi-discipline design practice celebrating 60 years of design and 30 years in Ireland.

c.1,000 Architects/Engineers worldwide providing a full range of specialisms:

- Architecture
- M&E Building Services
- Civil & Structural
- Sustainability
- Landscape Design
- Acoustics
- Specialist Lighting
- Ecology

Known as leaders in sustainable design:

- Our team in Dublin has won 30 awards within the last ten years
- Over 40 articles / research papers
- Regularly called as expert speakers / lecturers in sustainability
- Research feeds our unique innovation and insights
- Involved in all sectors

**30** years in  
**Dublin.**



## Introducing Wren Urban Nest

Opened to guests in September 2021

137 Hotel rooms that come in three sizes;

- Snug Nests (9.5sq.m)
- Cosy Rooms (12sq.m)
- Roomy Nests (18sq.m)

Lower Ground Floor Bar / Restaurant

Hotel Operator - Moran Hospitality

### Team:

Architecture  
Civil Structural  
M&E Building Services  
Acoustics  
Disability Access Consultancy  
Specialist Lighting



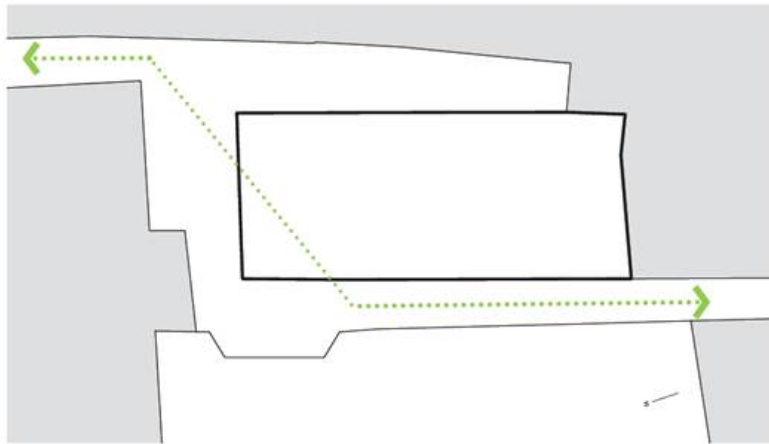
BDP.



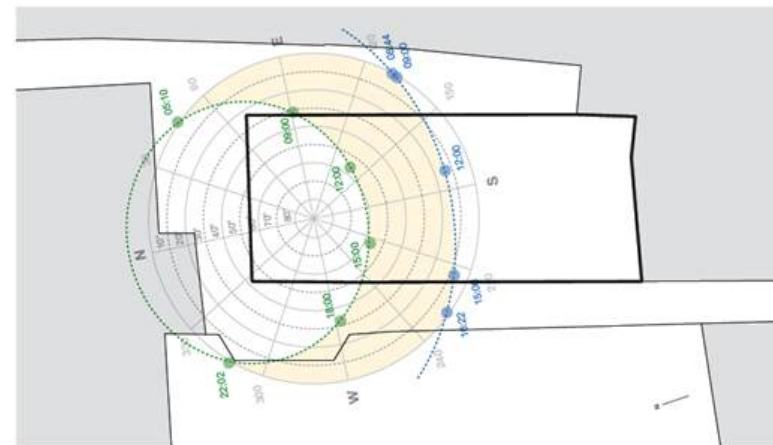
Location – St. Andrews Lane, Dublin 2



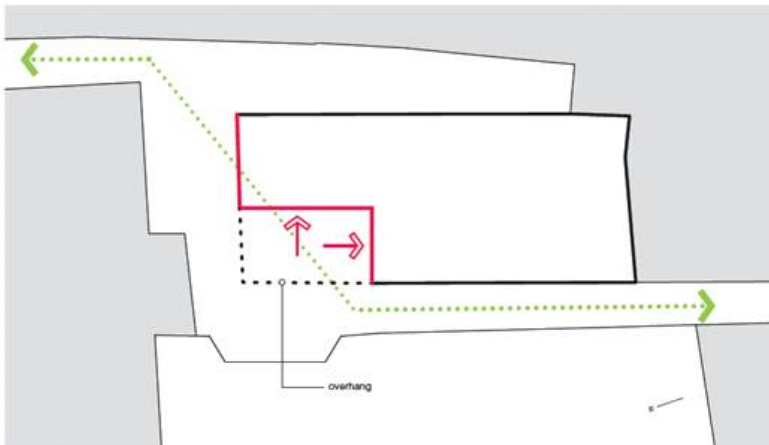
## Site Constraints



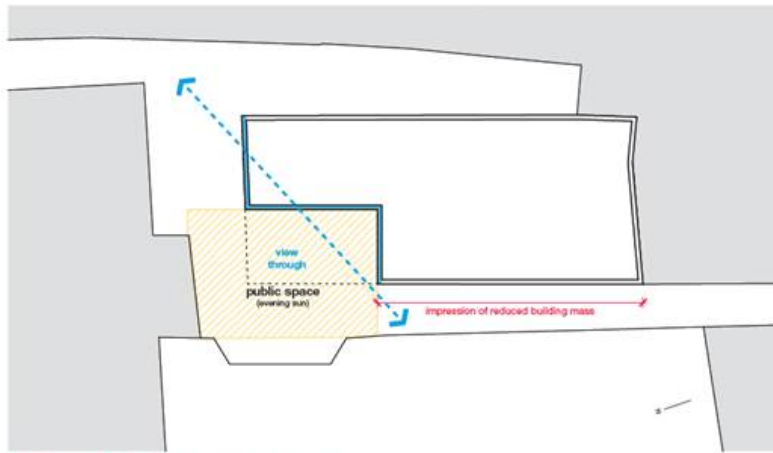
MOVEMENT DESIRE LINE



SUN PATH



SET BACK



BUILDING EDGE AT UPPER GROUND FLOOR LEVEL



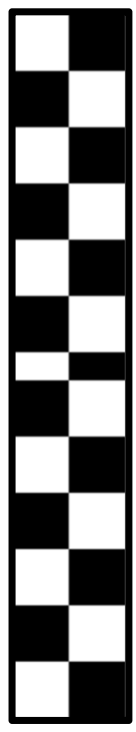
## Early Design Considerations



The rest of the industry seems to still be talking about NZEB



Finish Line





Meeting future market expectations



**Stranded Assets**

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## What is Net Zero Carbon ?



*“Our definition for a net zero carbon building is a highly energy efficient building that is fully powered from on-site and/or off-site renewable energy sources and offsets”*



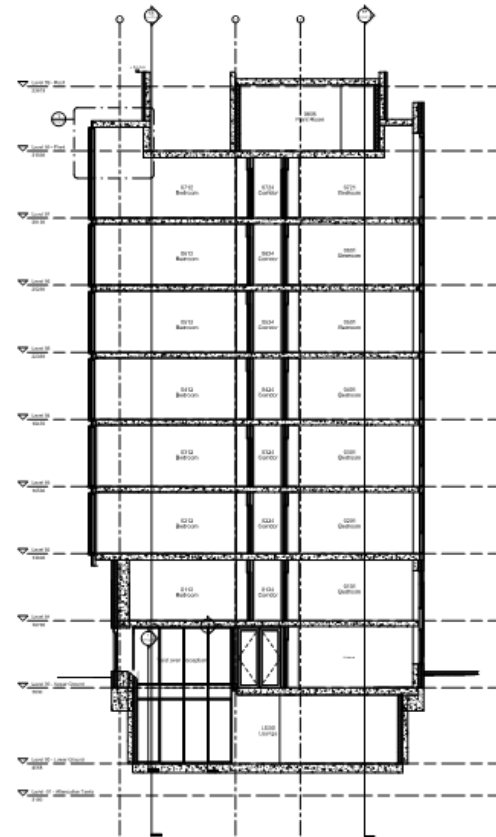
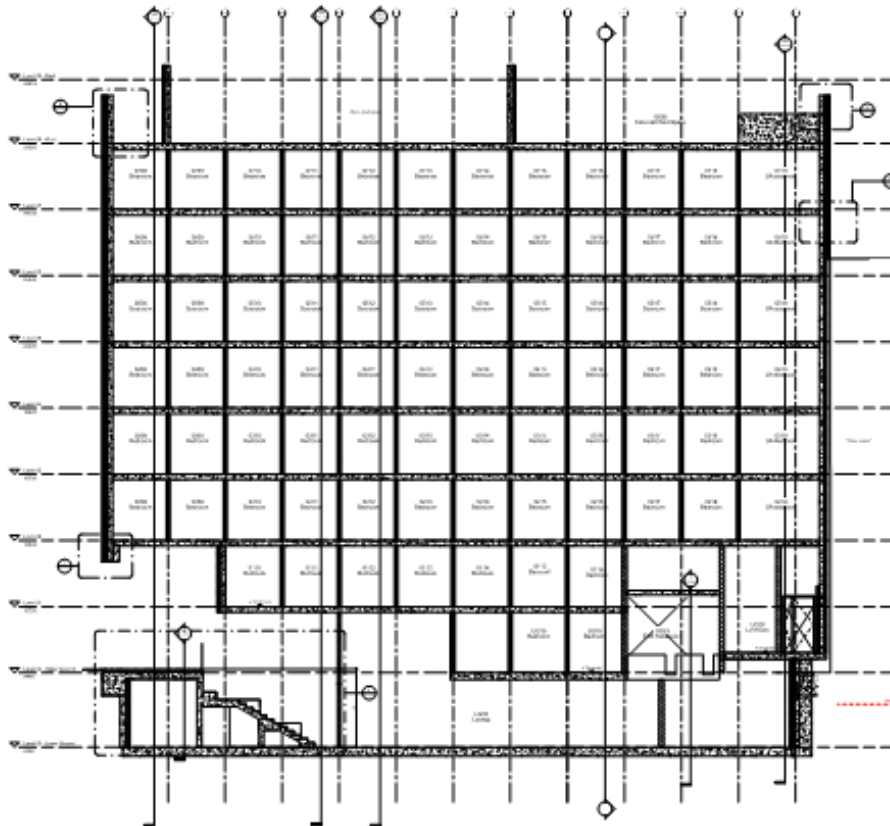
## Why is Absolute zero often “not practical” in Multi-Storey City Centre Buildings?



Heylen Warehouses Netherlands



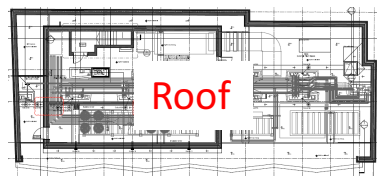
## Why is absolute zero often “not practical” in Multi-Storey Buildings?



32m long  
14m wide  
26m above ground  
9 Storeys above basement

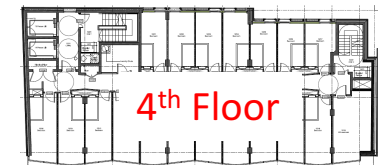
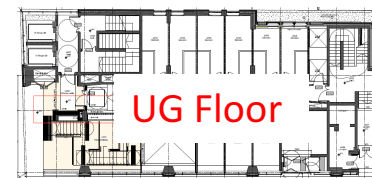
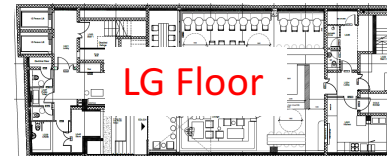


Why is absolute zero often “not practical”?



1:9

Solar Panel potential is very limited



Reality



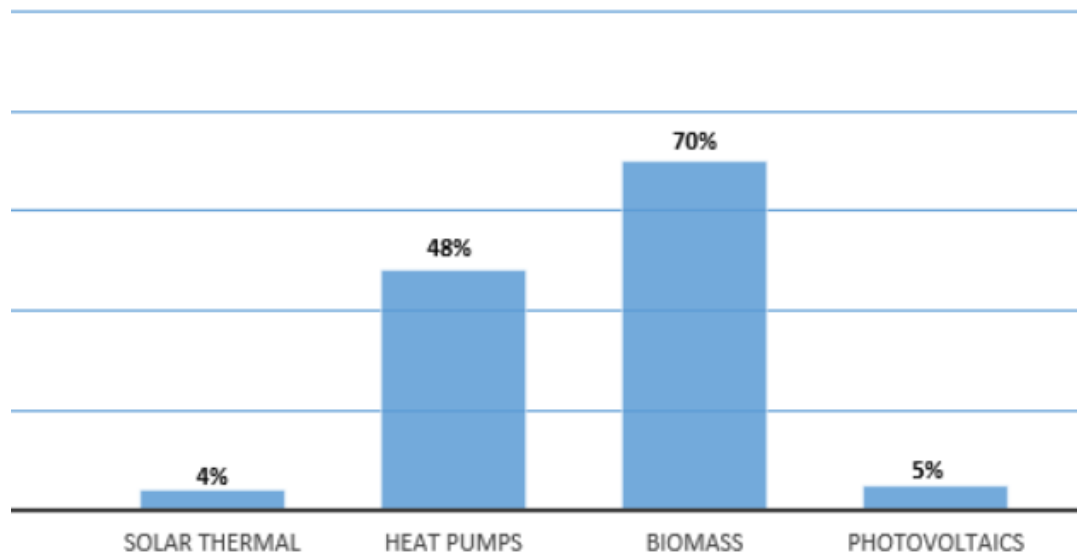
## M&E

Hotels have typically high heating and hot water loads

65% heating (fresh air and heat losses)

17% hot water

82% of the primary (building) energy is heating



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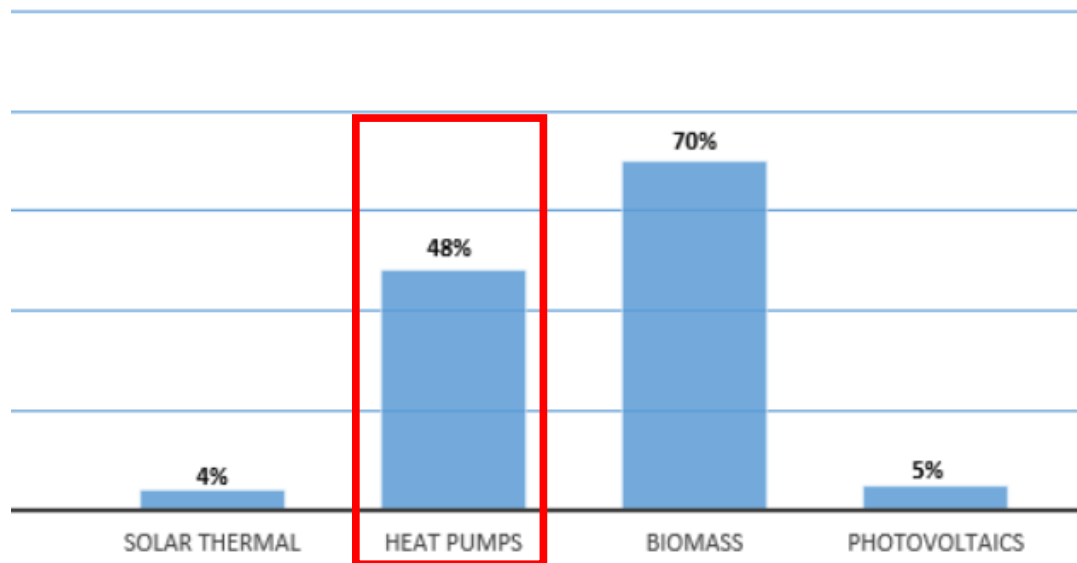
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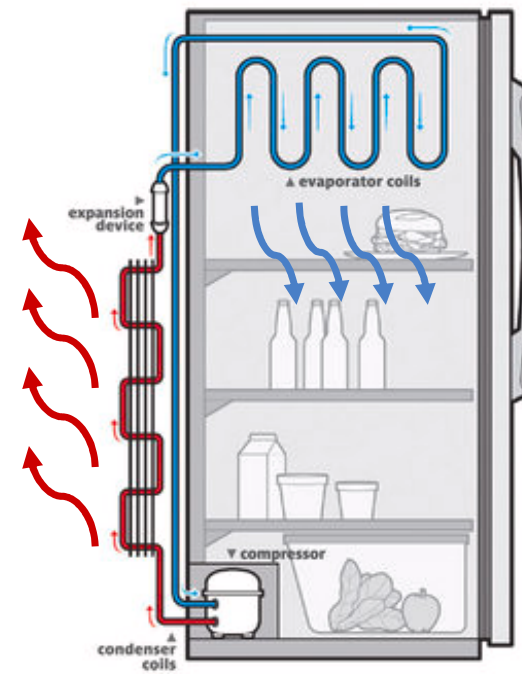




## Heat Pumps Explained



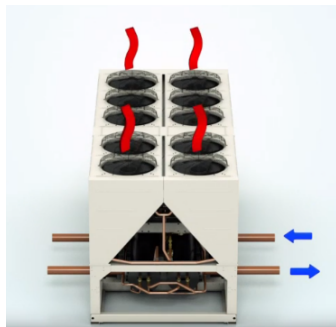
Leaving the fridge door open will actually heat the kitchen.....



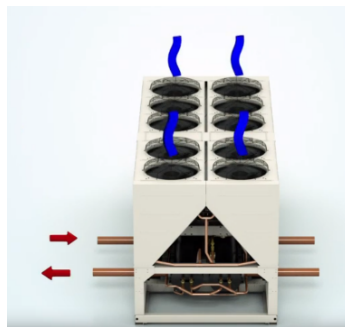
## Heat Pumps Explained

Two circuits with 5 different operating modes:

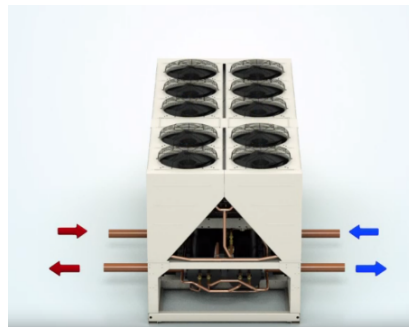
Cooling Only



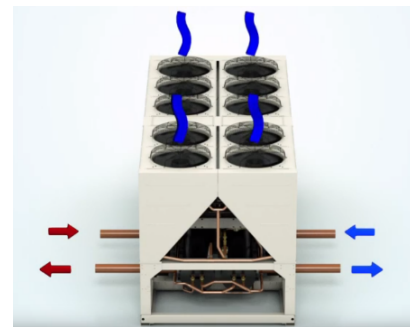
Heating Only



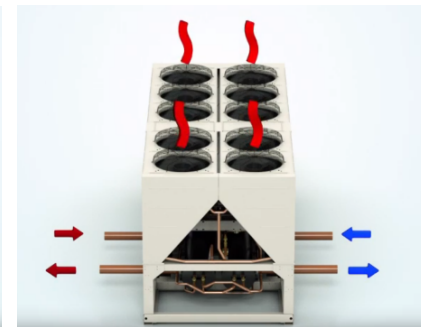
Heating  $\approx$  Cooling



Heating  $>$  Cooling

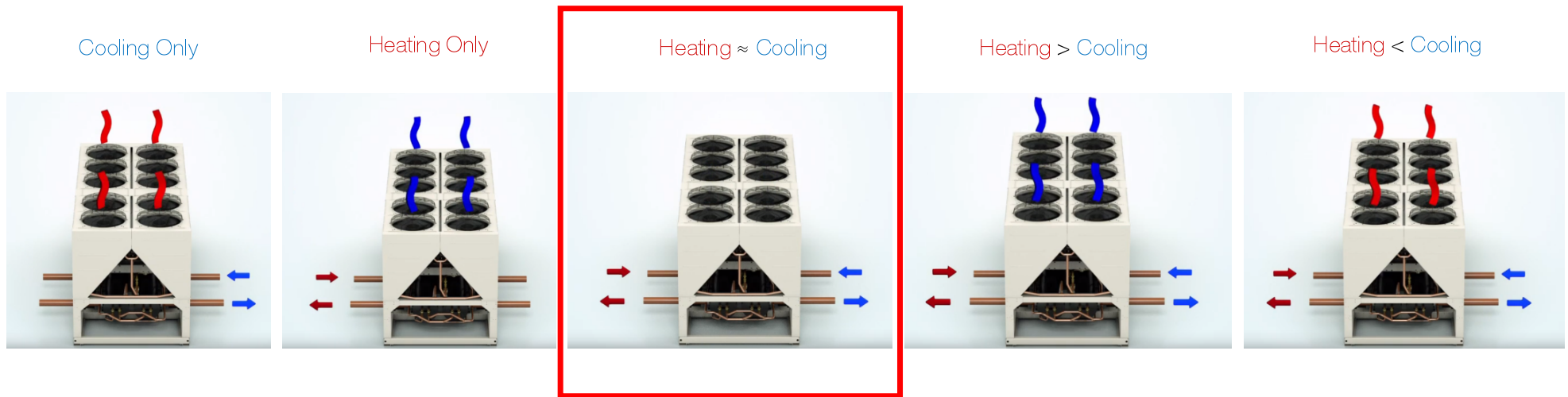


Heating  $<$  Cooling



## Heat Pumps Explained

Two circuits with 5 different operating modes:



COP > 8,0 (1 kW Electricity In = 8 kW Out)

Chilled Water @ 7°C

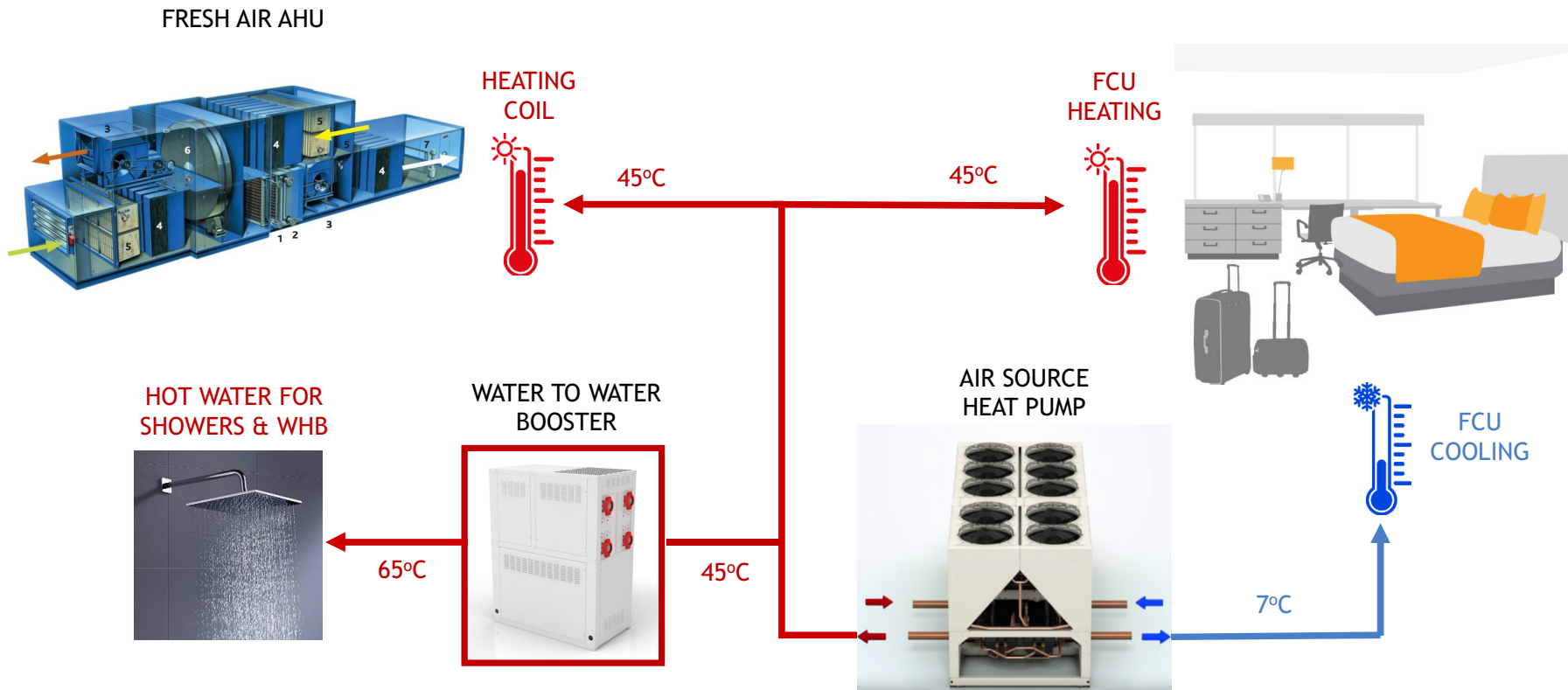
Heating Hot Water @ 45°C



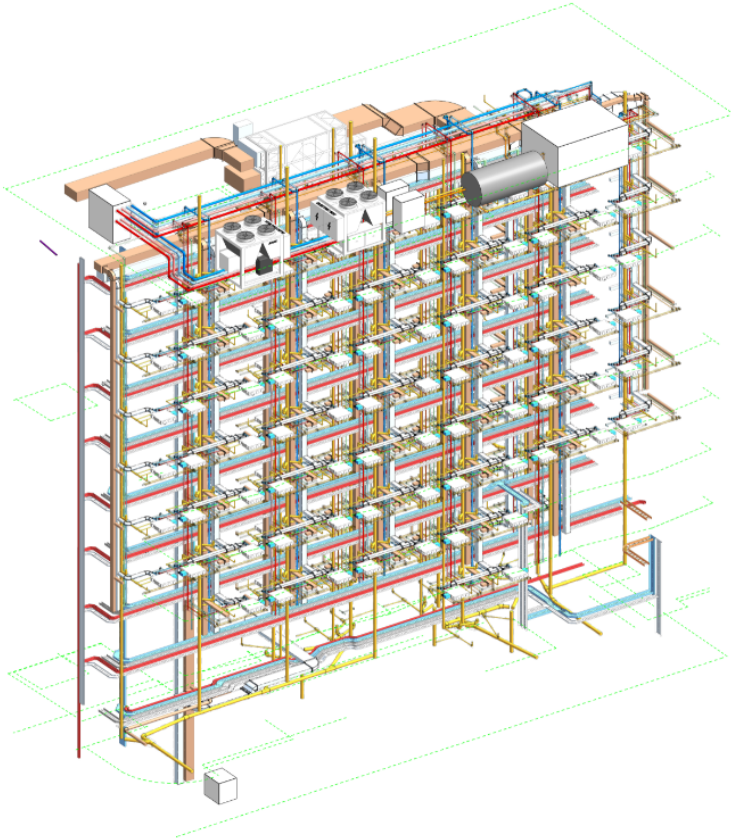
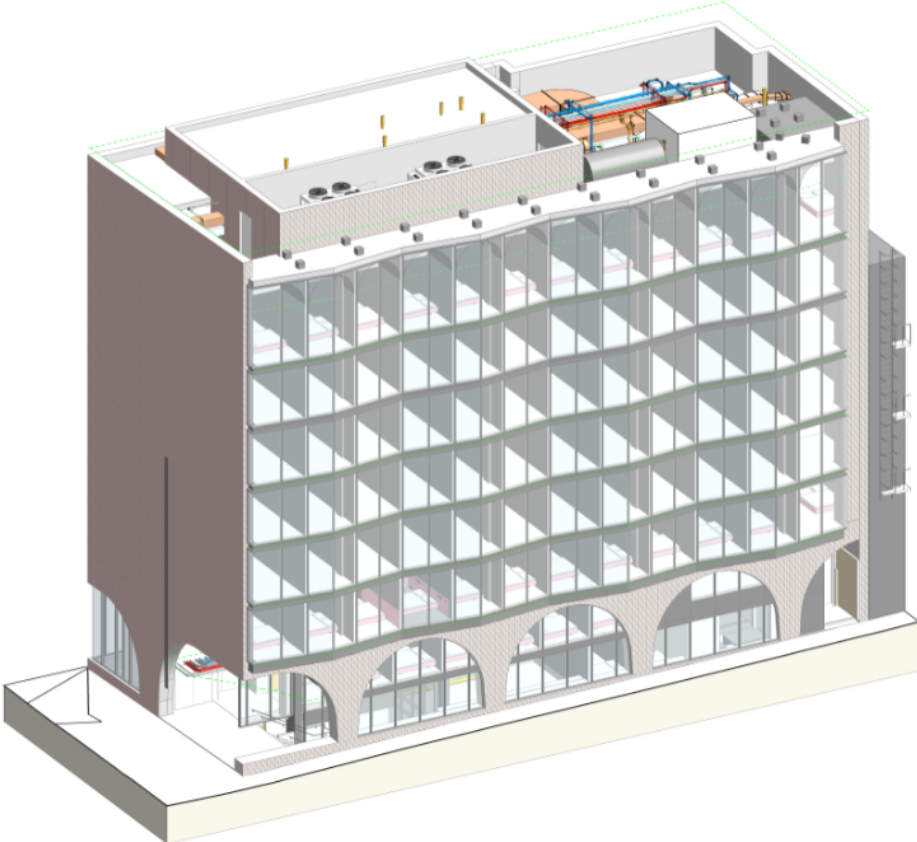
## Heat Pumps Explained



## Design Intent



# Design Coordination



## Kitchen

With the Kitchen Consultant (CIA Ireland) we designed out fossil fuels



No Gas Connection, No Boiler Room, No Flues & Zero Pollution

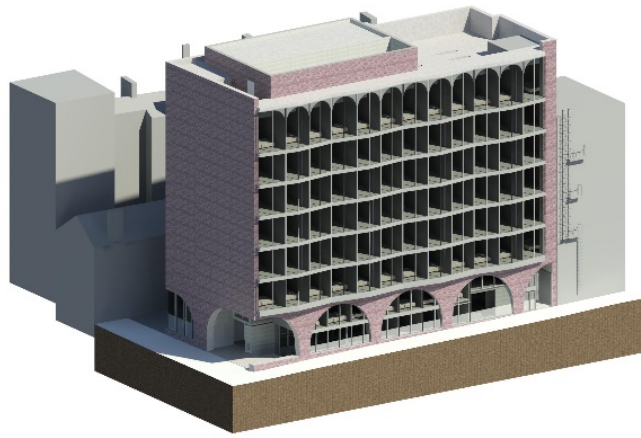


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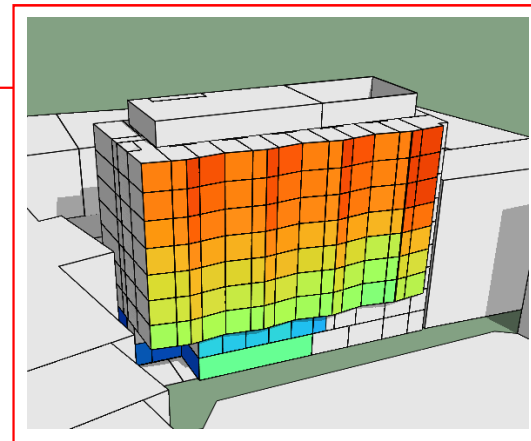
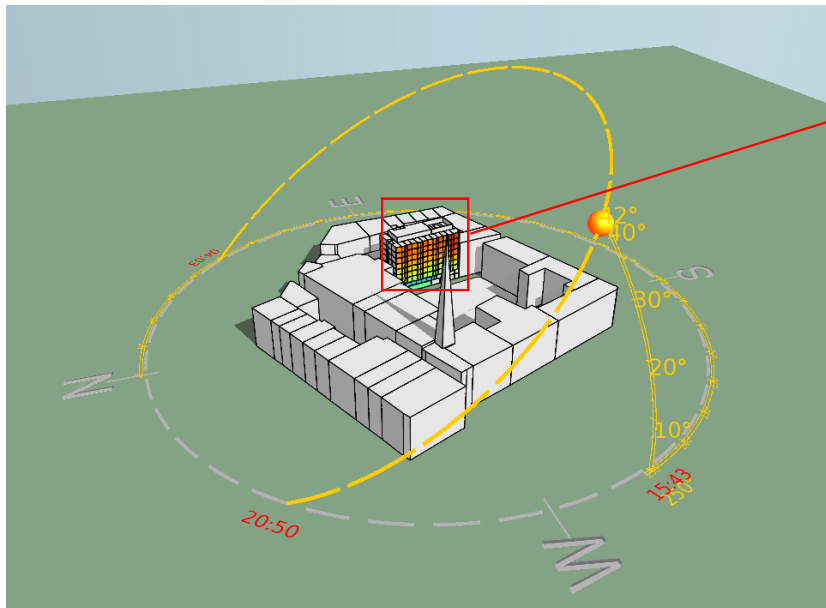
## Building Design



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## Passive Design

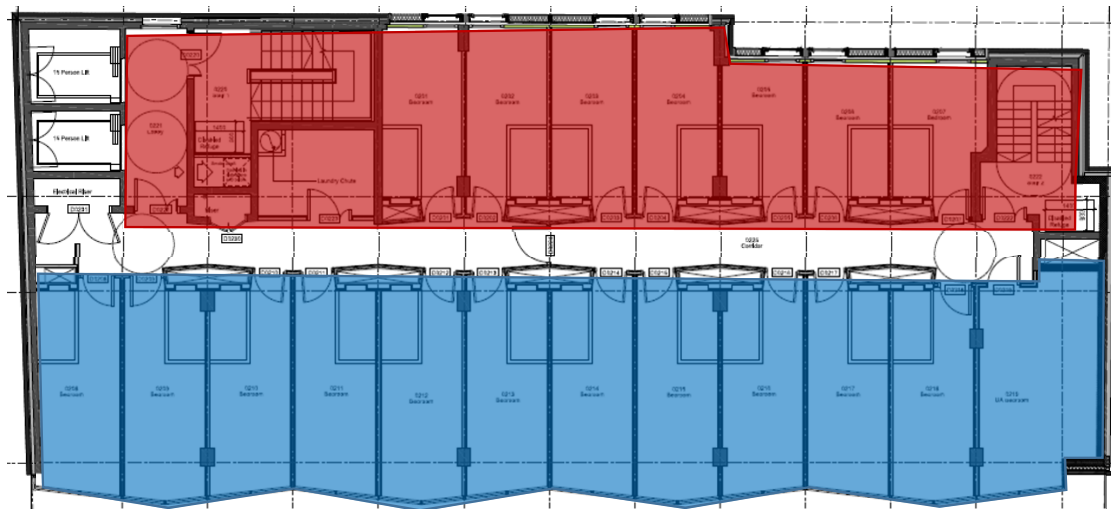


Bedrooms on the west façade in winter will still need to be cooled. So the system transfers the energy to the rooms in the shadow on the east façade or to hot water?



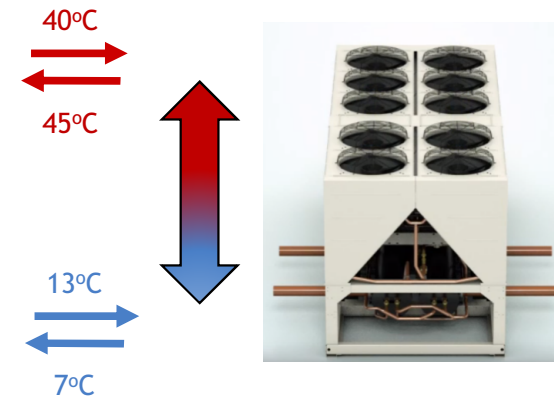
## Sharing Energy

Bedrooms on east façade in heating mode



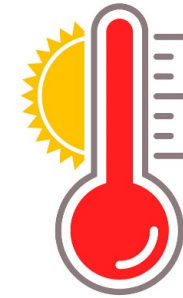
Bedrooms on west façade in cooling mode

AIR SOURCE HEAT PUMP  
HEAT TRANSFER



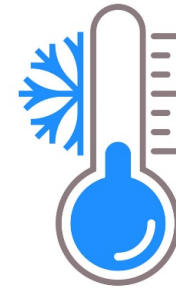
## Thermal Mass

Exposed slab absorbs solar gain during the day



## Thermal Mass

Exposed slab releases heat at night



## Operational Sustainability



Using local suppliers for ingredients, toiletries, soaps etc.



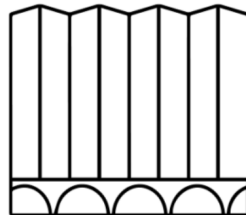
**Too Good To Go**

Too Good To Go lets app users buy surplus food from the hotel restaurant that would otherwise be going to waste



No single use plastics

<https://www.wrenhotel.ie/little-steps>



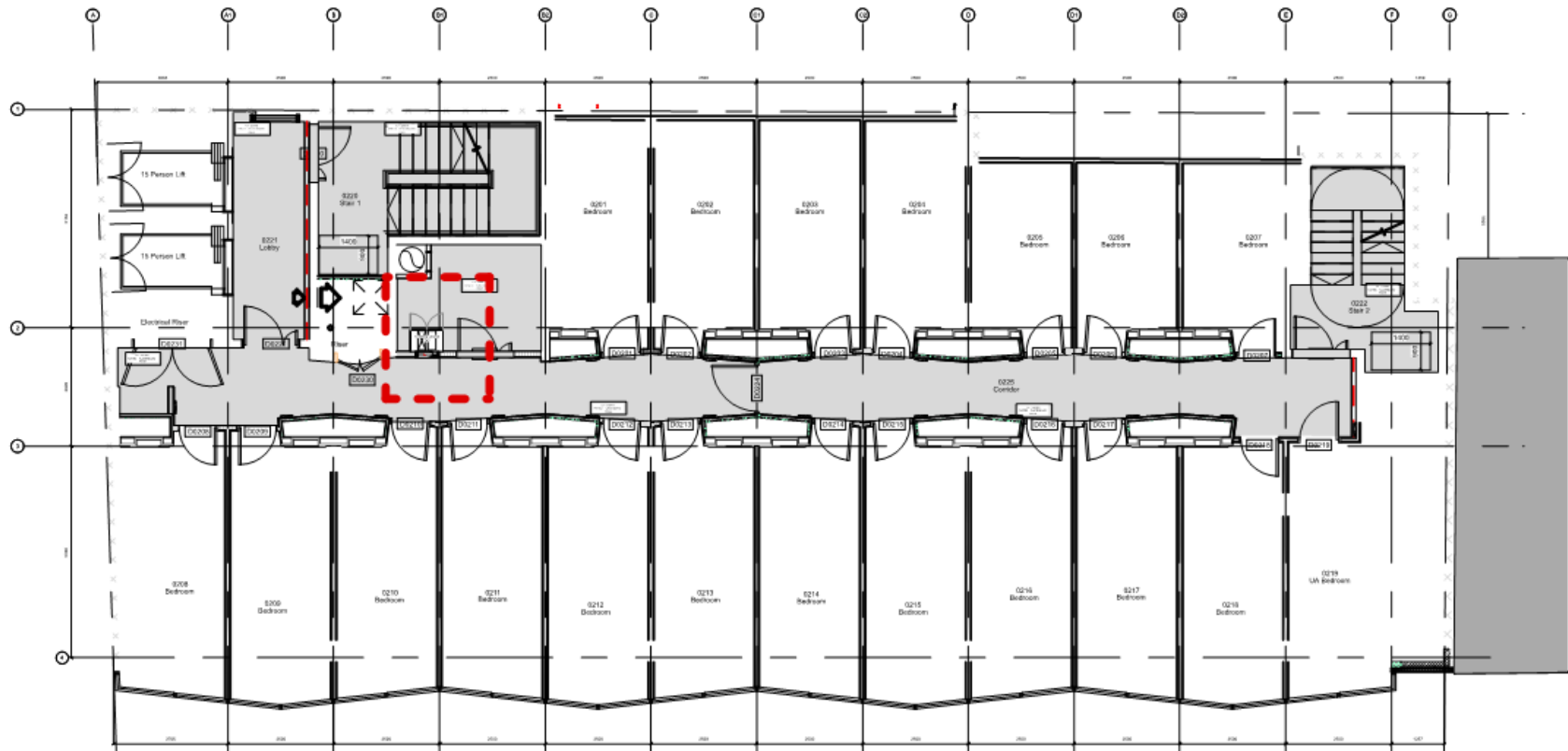
### **Our Commitment**

We believe in quality over quantity. We try to do our bit for the planet quietly and efficiently. We don't do single use plastics. We use local organic produce and we are committed to recycling.

**BDP.**



## Reducing Plastic Waste



## Other Sustainability Measures

**Water Conservation** - careful selection of sanitaryware i.e. rain showers 8 LPM vs 25 LPM

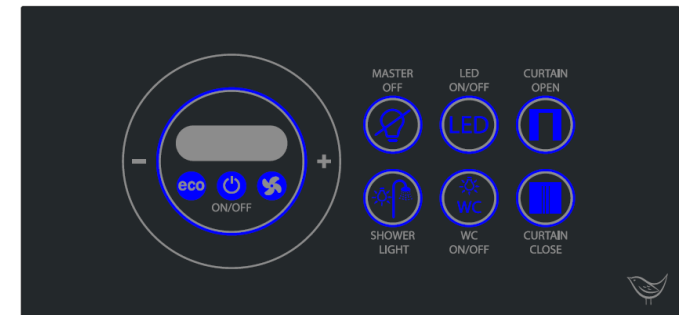
- ❑ Reduced cold water storage requirements
- ❑ Reduced hot water generation bills by >60% (compared with typical hotel with baths)

**Room Control** – Advanced room controls system to reduce energy

- ❑ Turns off non-essential room loads
- ❑ Setback of room temperature during unoccupied hours and overnight
- ❑ Can automatically close blinds to reduce peak cooling load
- ❑ Lighting scene selection and dimming to reduce lighting energy

**Material Selection** – Low embodied carbon – **'Build Less and then Build Clever'**

- ❑ Compact rooms still have every hotel luxury you need (137 keys vs 80 keys) but have a small embodied carbon footprint
- ❑ Use no extra material if not needed = exposed slabs, walls, staircores etc.
- ❑ Use locally sourced timber – Truwood Specialist Joinery





# Wren Urban Nest

[www.BDP.com](http://www.BDP.com)

ARCHITECTURE • DESIGN • ENGINEERING • URBANISM • SUSTAINABILITY • LIGHTING • ACOUSTICS



## Summary:

- BER A rated (only a handful in Ireland)
- On Site Renewable Energy Ratio >40%
- Net Zero Carbon (WGBC definition)
- Low Water Use
- Low Embodied Carbon
- No Fossil Fuels
- No Local Pollution
- Sustainable Hotel Operation
- Wren Urban Nest provides a Low Carbon footprint alternative for Dublin's visitors
- 'Luxury without the Guilt'.**

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