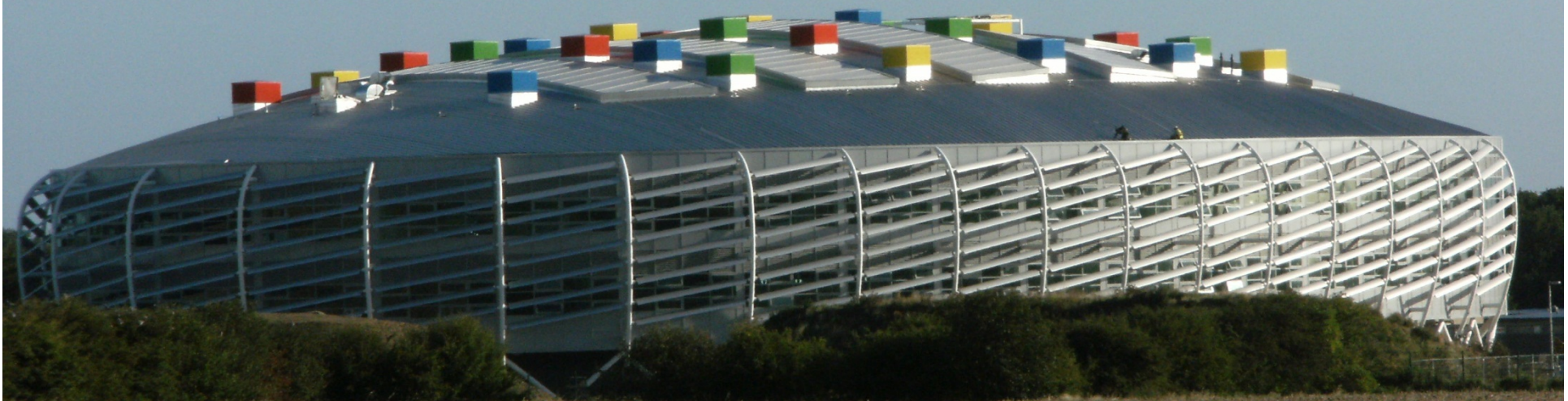


# From the Lab to the Construction Site

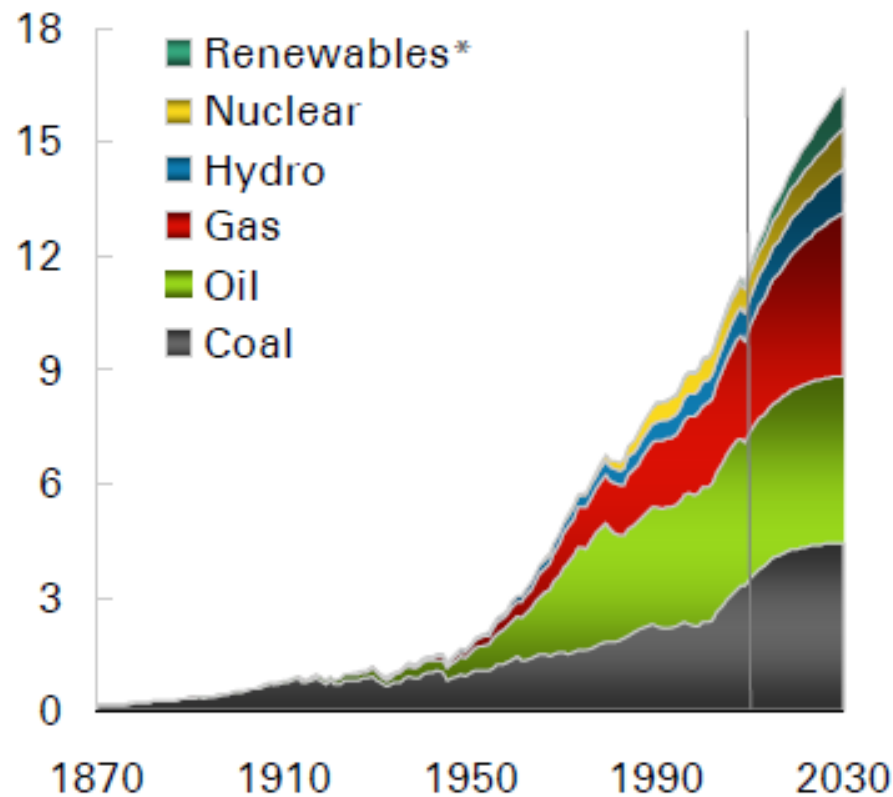


[shaun.fitzgerald@breathingbuildings.com](mailto:shaun.fitzgerald@breathingbuildings.com)

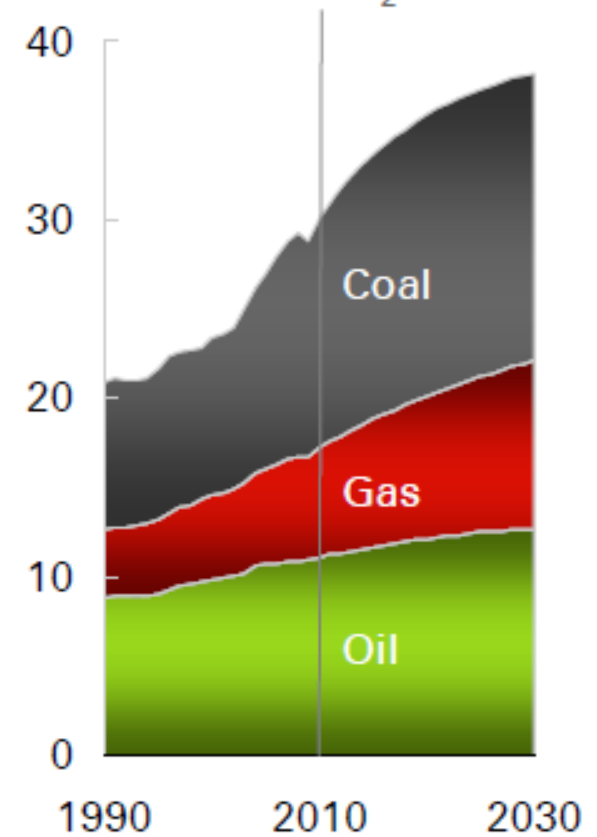
T +44 1223 450060

# Energy use & CO2 emissions rising

Billion toe



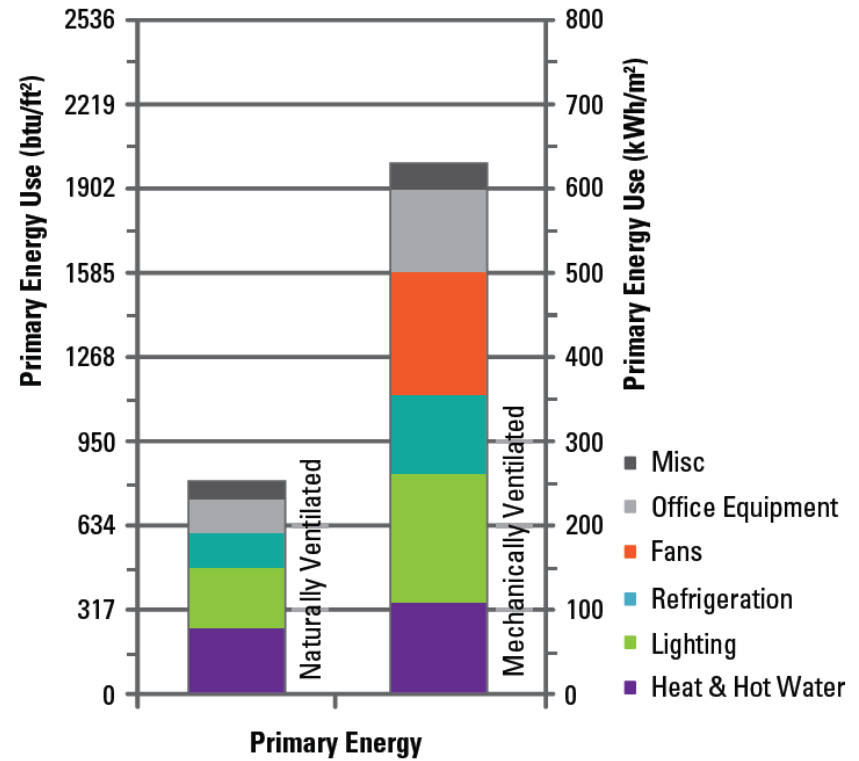
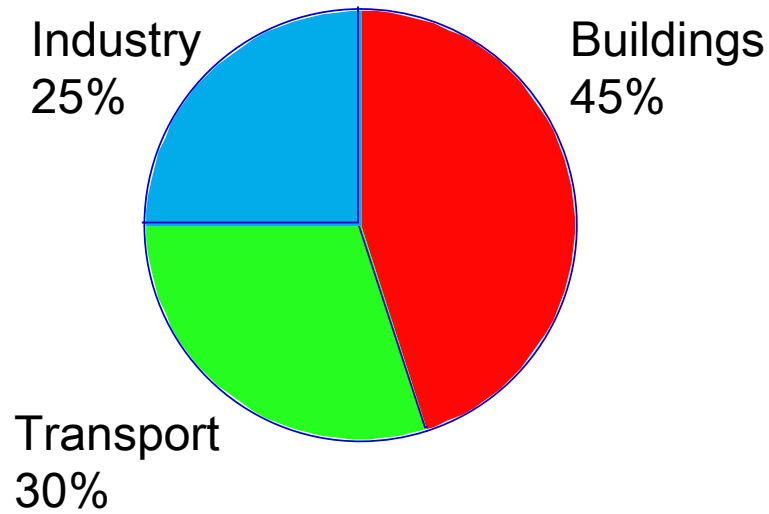
Billion tonnes CO<sub>2</sub>



Source: Energy Outlook 2030



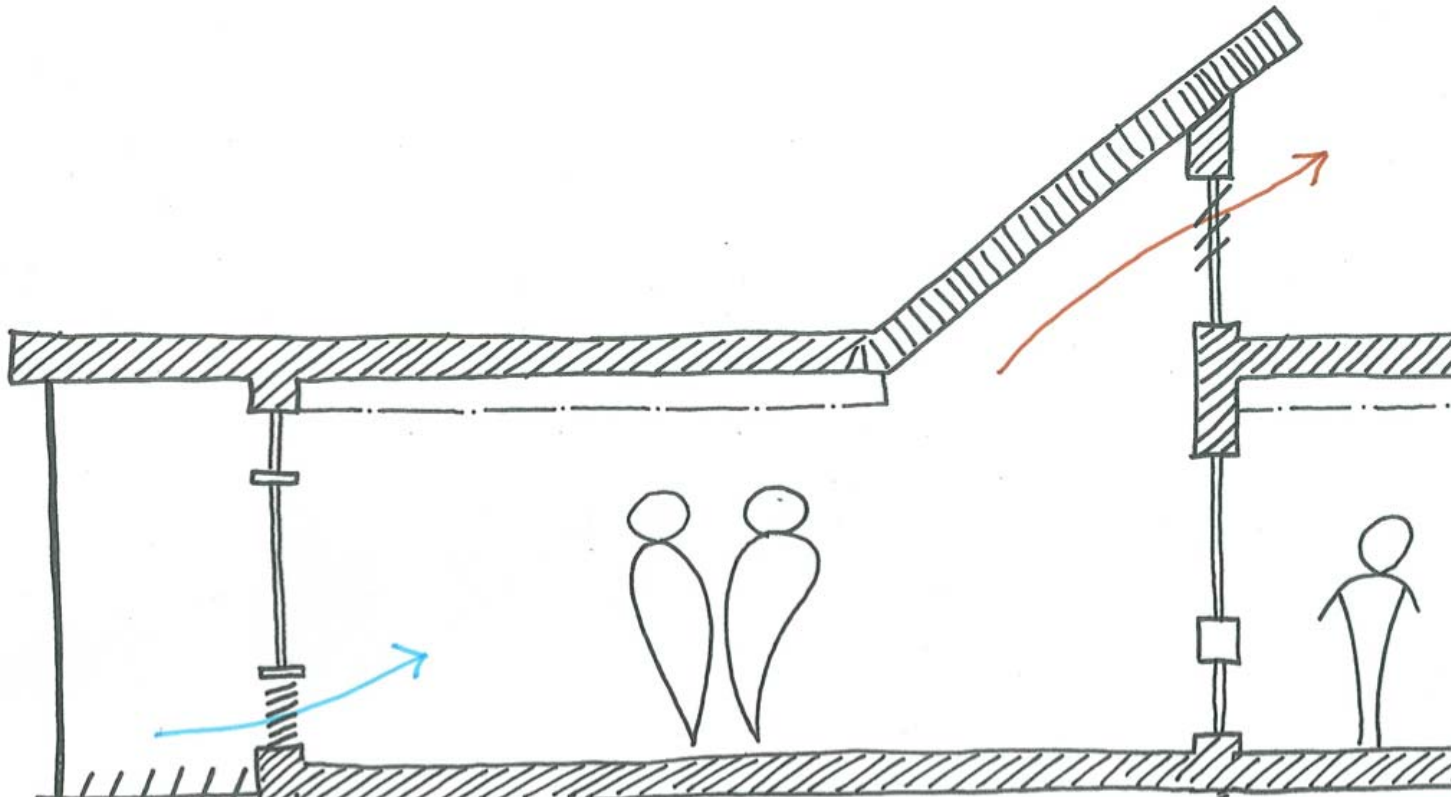
# Energy Use



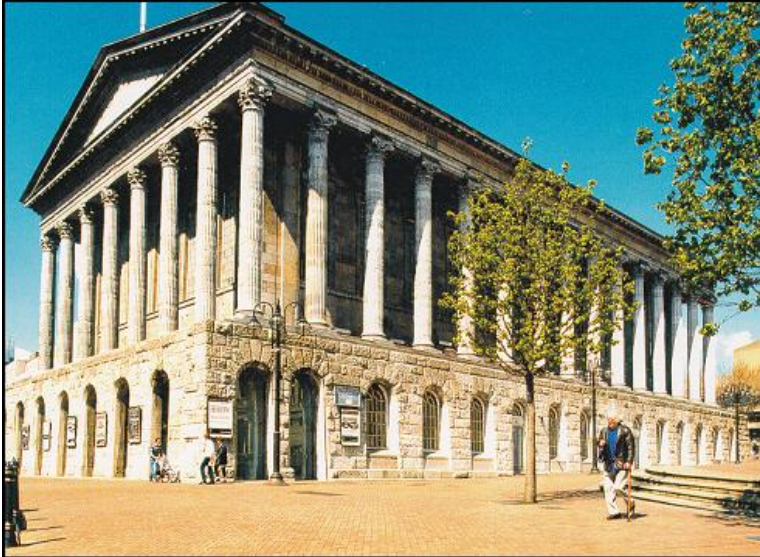
Source: Baker and Steemers

# RESEARCH INTO VENTILATION STACKS

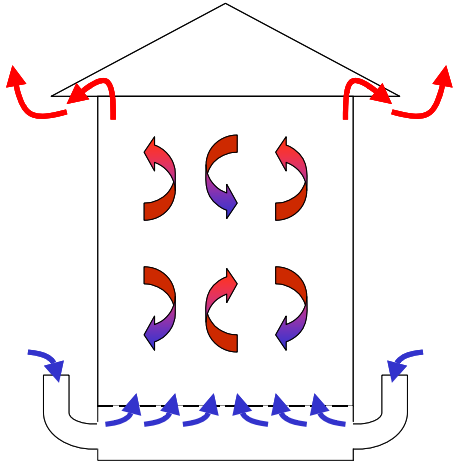
# Simple Naturally Ventilated Space



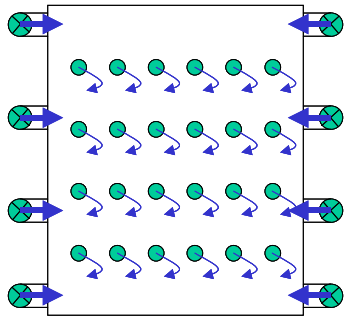
# Birmingham Town Hall



1834

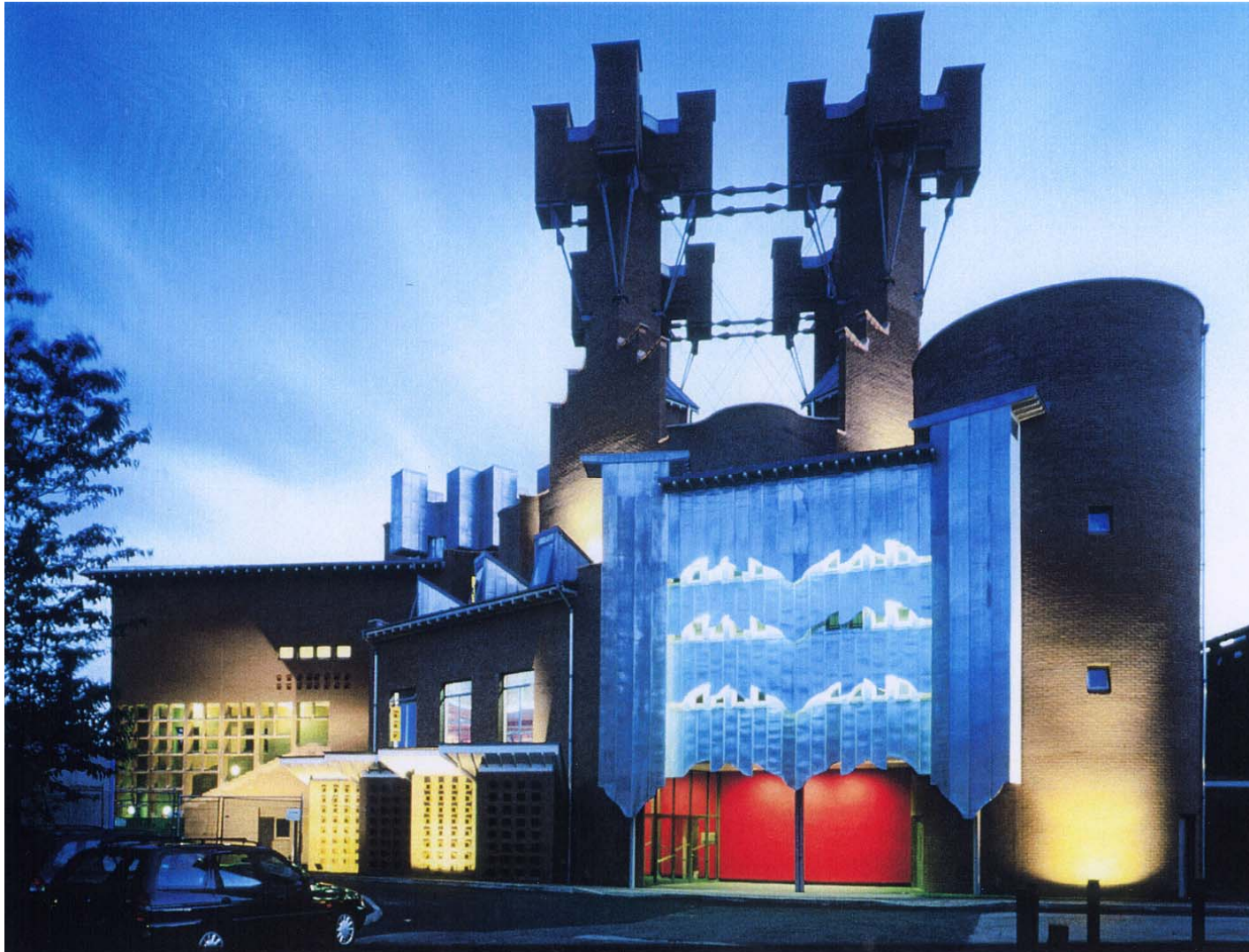


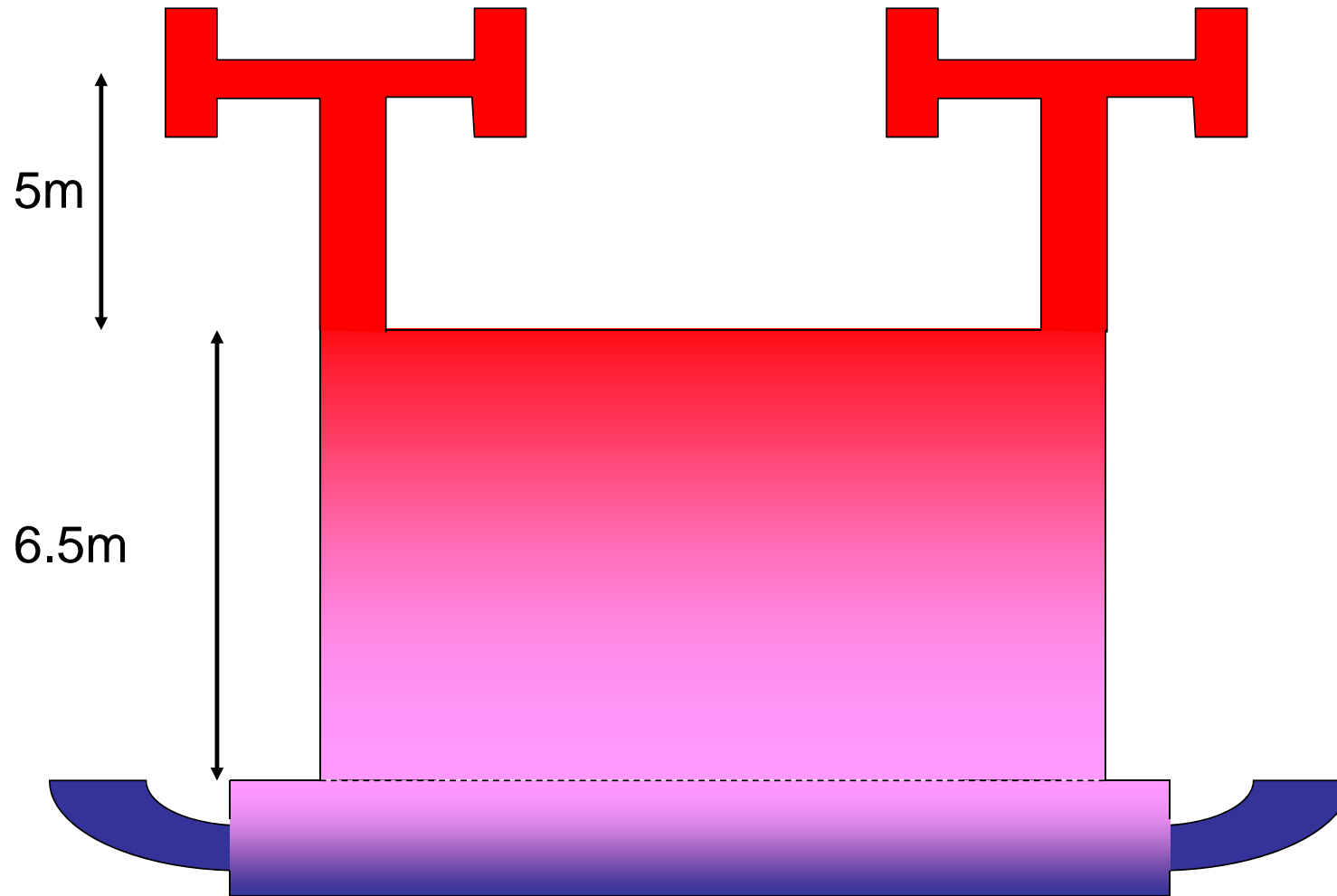
Schematic Flow



Floor Plan

# Contact Theatre

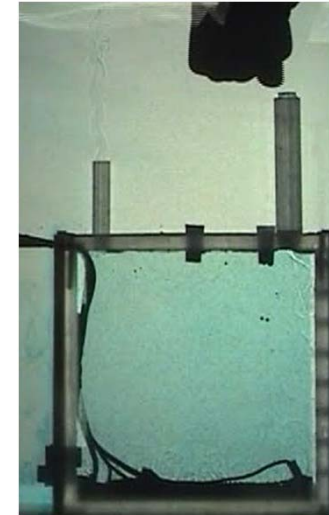
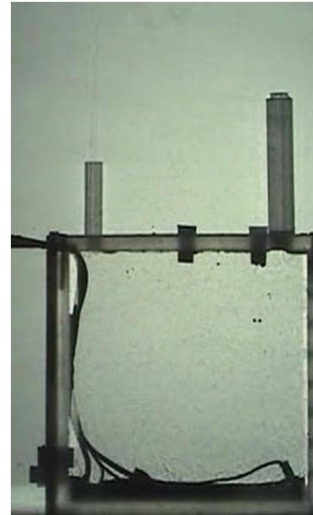
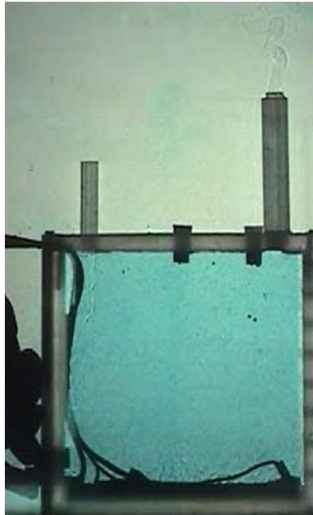




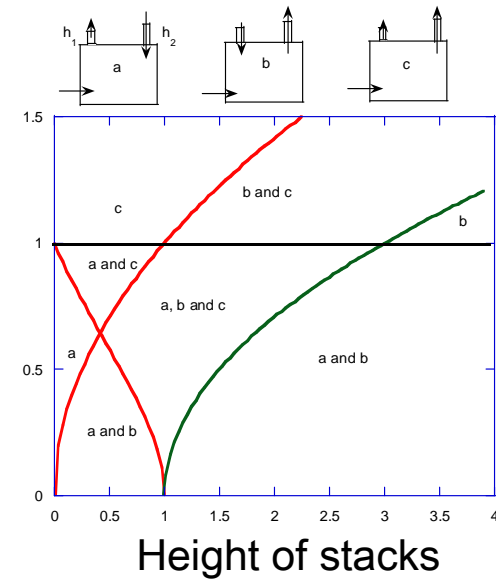
Concept - displacement ventilation when warmer inside



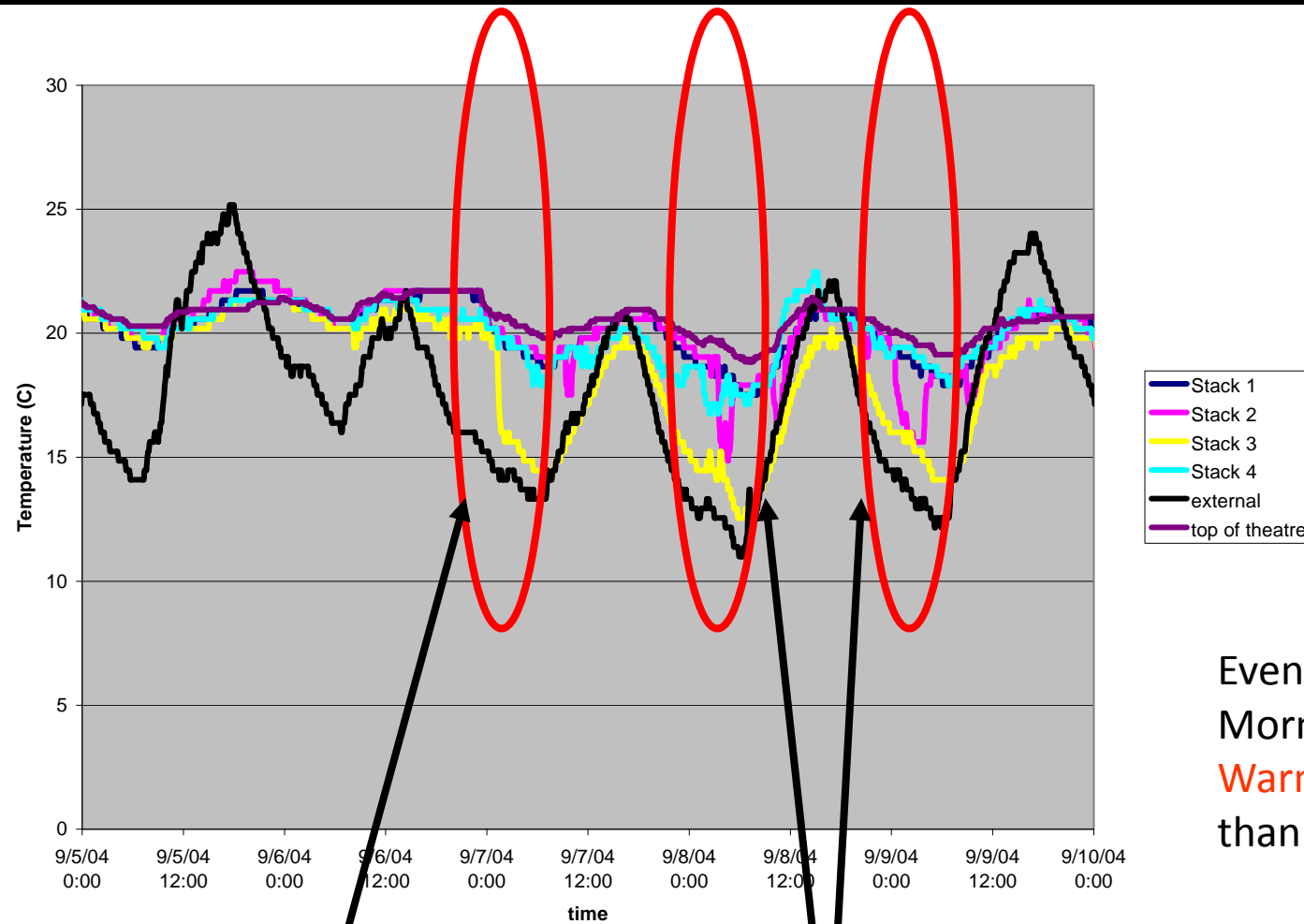
# Multiple Stacks



Area of lower aperture



# Varying Behaviour



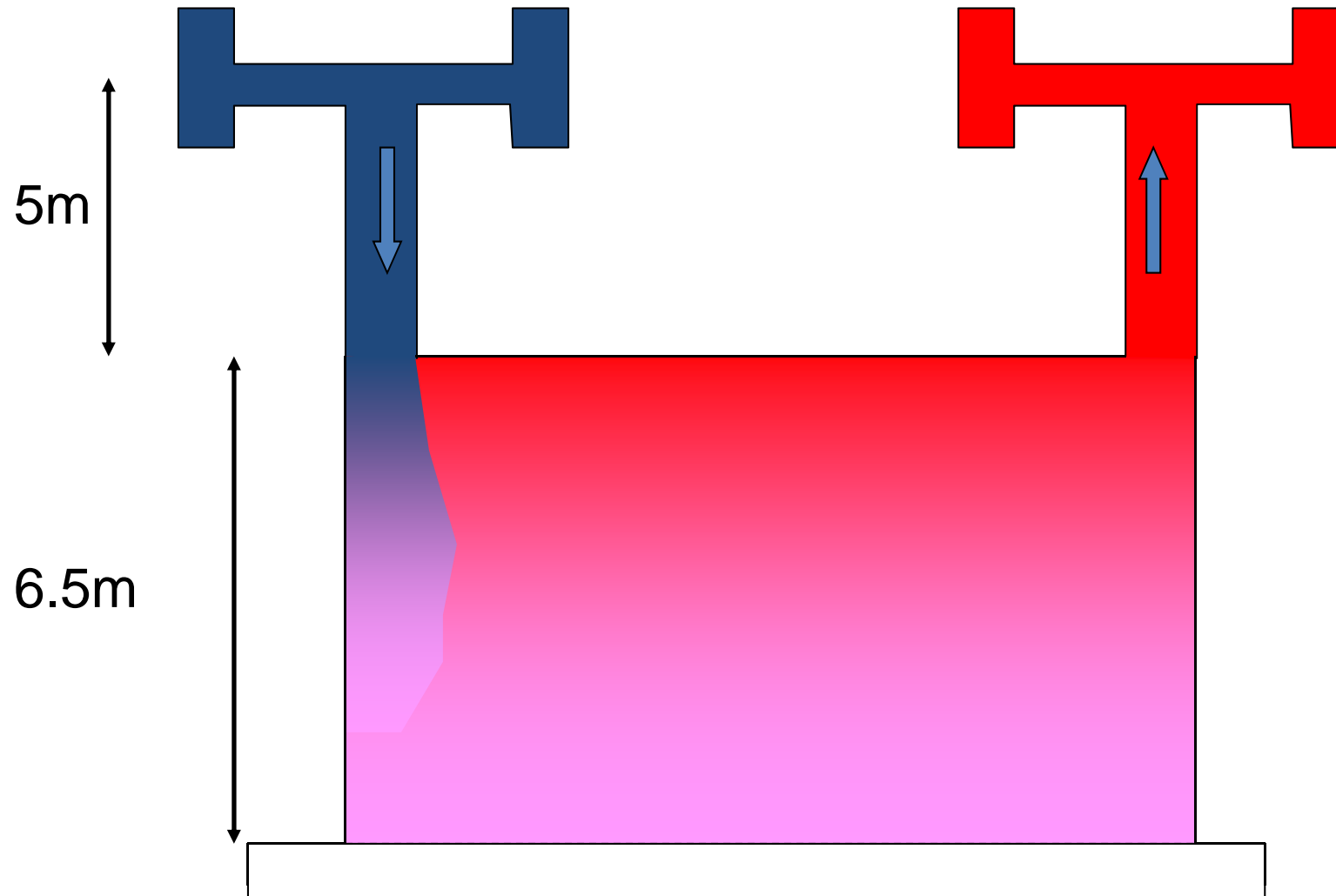
Evening/  
Morning  
Warmer inside  
than outside

Stack 3 inflow?

Stack 2 also inflow later?

Temperatures in some of the stacks are close to outside temperatures

# Mixing Ventilation



Ventilation modes are not always as expected....

# Natural Ventilation

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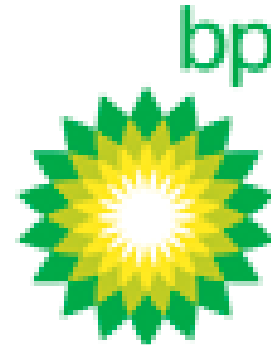


*e-stack, how natural ventilation should be.*

**Low Energy**  
**Natural Ventilation**

# Parties Involved

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# From idea to product



# Options



- Cash
- R&D facilities
- Sales channels
- Regulation knowledge
- Lobbying

- Maniacal focus
- Nimble
- No dead wood
- 24 hrs/day

# Motivations and Mindsets





