Mechanical Heat Recovery Ventilation (MVHR)
The M&E designers perspective

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What is Mechanical Heat Recovery Ventilation?
Why are we using MVHR?

1. To offer assurance of good indoor air quality (build tight ventilate right!)
2. To help reduce dwelling carbon emission rates
3. Contribute to the prevention of summertime overheating where background noise levels preclude the use of opening windows
4. Achieve CFSH level 4 or higher

or

1. Comply with Building Regulation F
2. To achieve the regulatory target emission rates and maximise glazing ratios for marketing purposes.
3. Quick fix for prevention of summertime overheating
4. Achieve the CFSH target established by the planning authority.
Typical Energy Demands - Part L 2010 compliant

- Hot Water
- Heating
- Lighting
- Cooling
- Auxiliary

- Hot water dominant
- Thermally dominant

Opportunity to further reduce heating demand via heat recovery

~65%
Why MVHR?
Comparison with Natural Ventilation

Comparison of Target Emission Rating (TER) with Dwelling Emission Rating (DER) using either natural ventilation or mechanical ventilation with heat recovery, for a sample of dwellings.

The SAP method typically shows a 2%-10% saving in carbon emissions, with MVHR.

MVHR: assumes 90% heat recovery efficiency and specific fan power 0.6W/l/s.
MVHR – Concept stage design

MVHR Fan
Background Kitchen Extract

Fan Coil System (HTG & CLG)

Option to distribute warm air to perimeter

External Louvres; Air Intake & Exhaust and Dedicated Kitchen Exhaust and Make-up

Dedicated Kitchen Extract

SECTION OF APARTMENT SHOWING VENTILATION PRINCIPLES
MVHR – Concept stage design
MVHR – Integration to Utility Cupboards

- Utility cupboard extract air connection
- WHV supply/extract and intake/exhaust ducts
- Domestic hot water and heating pipework
- Incoming LTHW and cold water feed
- Heat Interface Unit (HIU)
- Attenuators
- Drainage pipes
- Consumer unit
- Whole House Vent (WHV) fan
- Heat meter display and HIU programmer
- Sprinkler valves
- Underfloor heating manifold
- Underfloor heating circuits
MVHR – Scheme Design
MVHR and Comfort Cooling – Scheme design
MVHR – From Concept to Detailed design
MVHR – From Detailed design to Construction
MVHR – Purge Ventilation
MVHR - Purge Ventilation
Summary

• Is there a tendency to default to MVHR on the basis that it will offer carbon reductions in the SAP calculations?

• Should we perhaps be further optimising the building design before seeking to improve carbon performance using MVHR?

• If MVHR is adopted, simple ductwork distribution is required
  - Minimise bends
  - Good separation between air intake and discharge points
  - Duct sizes will increase where MVHR is used to overcome summertime overheating.

• Positioning of the MVHR within dwellings is a key issue
  - Noise
  - Fan Capability
  - Ductwork routes
  - Ceiling void depths
Thank you

Any questions?

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