

# Thamesmead Condensation, Damp and Mould Strategy. The use of smart thermostats to assess ventilation interventions with demand controlled ventilation.

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## Introduction

An implementation of a Condensation, Damp and Mould (CD&M) Strategy for the Thamesmead estate in south-east London Targeting 2000 homes.

The evidence-based strategy is designed to manage CD&M systematically and focus on homes that will not be refurbished or replaced for some time. CD&M risk assessments and surveys are used to identify homes for a range of interventions, including energy advice, smart heating controllers and demand-controlled mechanical extract ventilation, in various combinations.

Evaluation of the first phase of the programme indicates that it is effective in reducing CD&M and increasing the affordability of heating with the potential to improve health outcomes for residents. Analysis of IAQ has come through innovative use of data from smart thermostats and evaluation of vapour pressure.

## Thamesmead, London

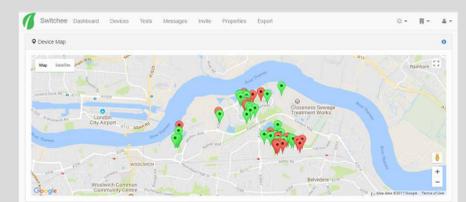
- **Built by in 1970s**
  - High-rise tower blocks
  - Medium-rise deck access blocks
  - RC frame and PC panel construction
- **Significant fuel poverty**
  - Under-heated and under-ventilated
  - Condensation, damp and mould
- **Significant CDM**
  - Stock condition survey recorded that 18% of homes had damp and mould issues
  - 3000 CDM-related repairs logged in 2015-16, affecting 1900 homes
  - Mould wash and redecoration treatments costing £1275 per home



## Smart Heating Controller

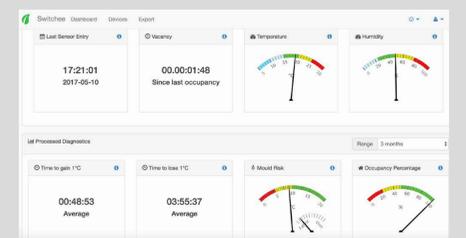
The Switchee heating controller is a new device designed for social housing. It replaces the room thermostat and programmer, and has all the usual 'smart' functions: it senses occupancy and sets back the heating when the home is unoccupied; it 'learns' the occupancy pattern and anticipates the demand for heat; and it controls the internal temperature in the home to the set level. Switchee can operate autonomously, without intervention from residents, or they can adjust the temperature via a touch-screen if they wish.

such as how long a home takes to heat up by 1°C and the background temperature to which the house will fall when the heating is off, and it can flag homes that are underheated or overheated, or which have high RH levels.



The value of Switchee to the CDM programme is its ability to identify homes where there is under-heating, under-ventilation or high RH (indicating condensation and mould risk) so that interventions can be targeted. Switchee also allows homes to be monitored after improvements have been made, to confirm effectiveness; and it allows energy advisors to brief themselves prior to advice visits.

The important feature of Switchee, for the CDM programme, is that it monitors the home and makes data available to the landlord via a GSM connection and an online 'dashboard'. Switchee has sensors that monitor occupancy (movement), temperature, relative humidity (RH), use of the heating system (on or off) and the demand temperature setting. The Switchee software also calculates indicators



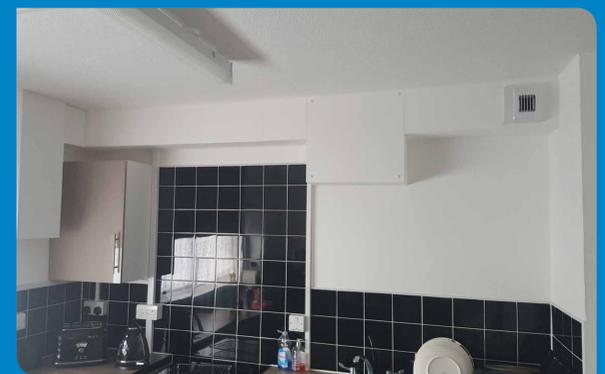
## Demand Controlled Ventilation

The ventilation performance specification recommended to and adopted by the Thamesmead CDM team is:

1. Continuous mechanical extract ventilation, centralised (cMEV).
2. Minimum whole-house ventilation rates in background and boost modes consistent with UK Building Regulations ADF
3. An increase of 20% over the published extract air flow rate values

4. Calculation of minimum ADF ventilation rates based on occupancy of two persons per bedroom, or three persons in a one-bedroom home.
5. Demand controlled ventilation (DCV): ventilation rates controlled by RH sensors so that they are continually matched to the ventilation requirement, eliminating both under-ventilation and over-ventilation.

This ventilation package was supplied by Aereco and delivered through the Aereco Quality standard, a framework that ensured quality control, oversight and sign off of the ventilation works in each property.

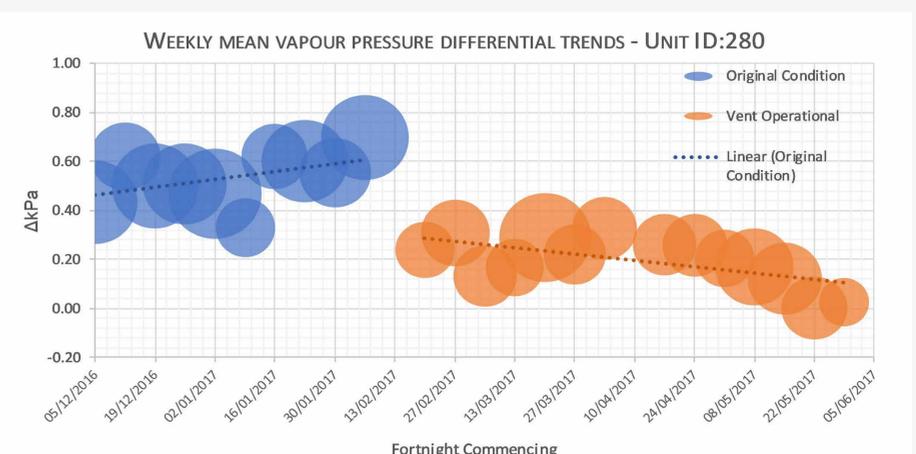


## Results and Conclusions

Based on the data available for the interventions completed-to-date, the programme is effective in eliminating condensation and mould. The CDM surveys have shown that the risk assessment process is a good method for identifying homes at risk of condensation and mould, using existing data.

Measure	Interventions (to June 2018)
Energy advice visit	186
Switchee smart heating controller	149
Cavity wall insulation	229
Boiler replacement	15
Mould wash	242
New Aereco demand-controlled ventilation system	168
Upgraded ventilation system (The Moorings)	68
<b>Total</b>	<b>1057</b>

Further analysis of the data was performed using differential vapour pressure. The data using weekly averages are given in the example chart hereby. The original conditions of the dwellings are indicated in blue, with vapour pressure excess (VPX or ΔVP) plotted on the y-axis, which represents the average for that week. The size of the bubble represents the range between the 10th and 90th percentiles. The orange bubbles represent the situation after intervention.



The monitoring facility that the Switchee device provides is a powerful tool for the landlord: it enables homes at risk of CDM to be identified and targeted, energy advice to be customised to households' circumstances and behaviour, and the effectiveness of interventions to be monitored.