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# Reflecting on Retrofit

6 years on from  
Community Green Deal

Dom's data rich analysis  
Dominic McCann

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# Intro

**This project has been pivotal in allowing lessons to be learned.**

→ **Why data?**

Data and lots of it. Pooling data. Tracking data.

→ **Collaboration**

Pooling data means collaboration. Sharing experiences. The good and the less good.

→ **What next?**

Some things have changed and a lot has been learned.

# Milestones

**Feb-June 2014**

Main insulation works

**2015**

All houses showed big reduction in energy use  
Including 60% reduction in CO2 emissions

2014

2015 - 2020

**Oct-Nov 2014**

Solar PV installed

**Feb-Mar 2018**

Beast from the East  
A big test but no problems for retrofit houses

# What have we learned

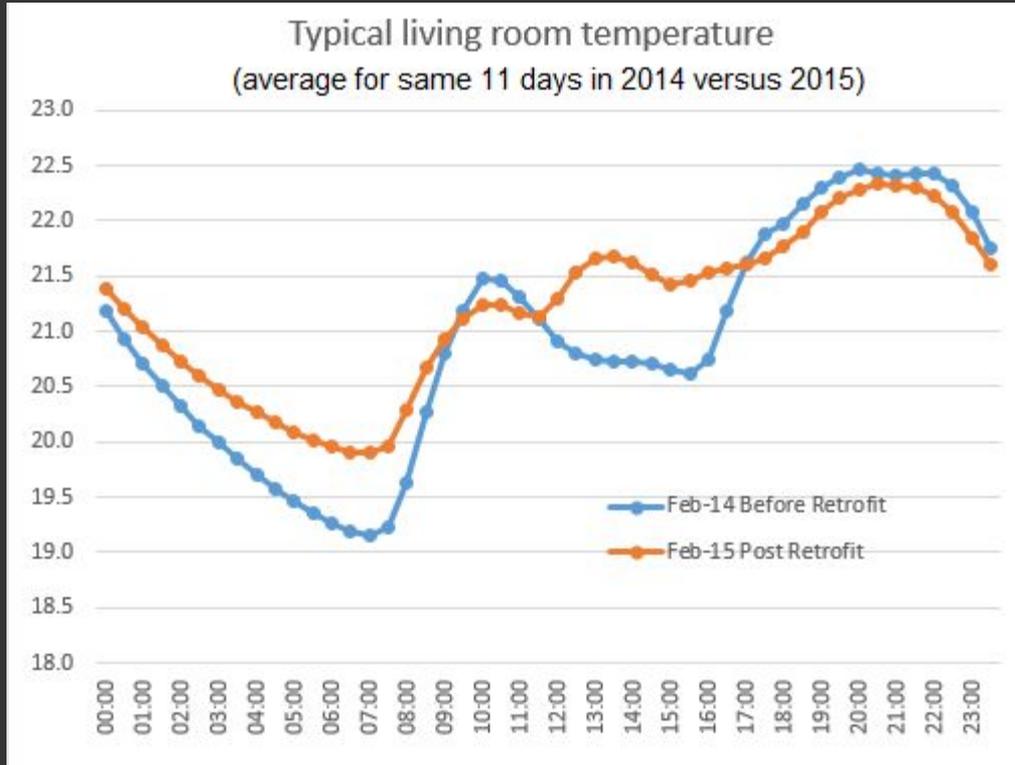
- Energy Performance / Big Headlines
- Comfort take - how does it happen
- Learning to live with lower energy / retrofit
- The good and the bad
- What next?

# – Performance / Big Headlines

- The average saving in gas use  
= 44% reduction / 47% reduction in SHD.
- Stable over time  
despite individual household  
performance being quite variable.
- Tracking energy use is tricky and  
requires patience.
- Electricity and electrification

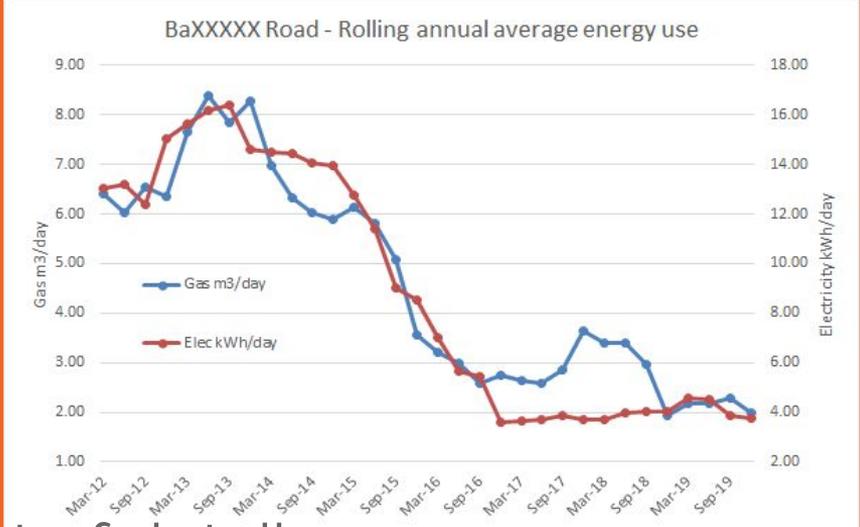
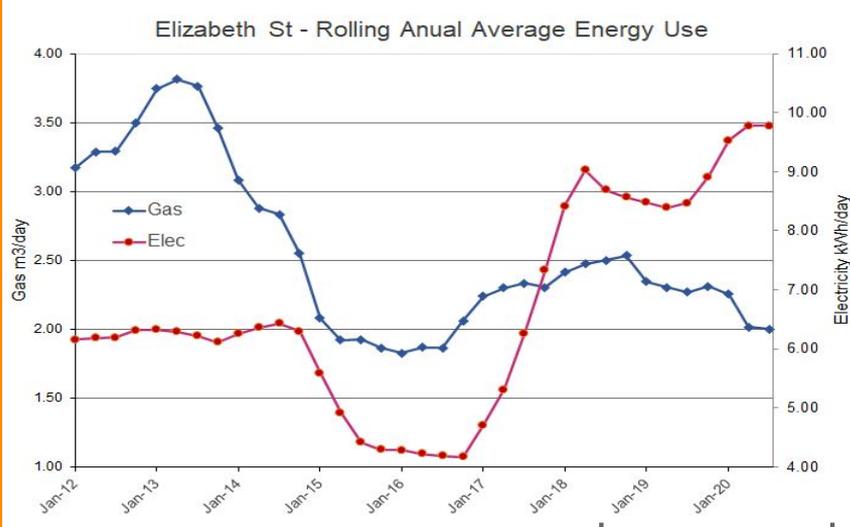
# – Comfort take.

## It isn't just human frailty!

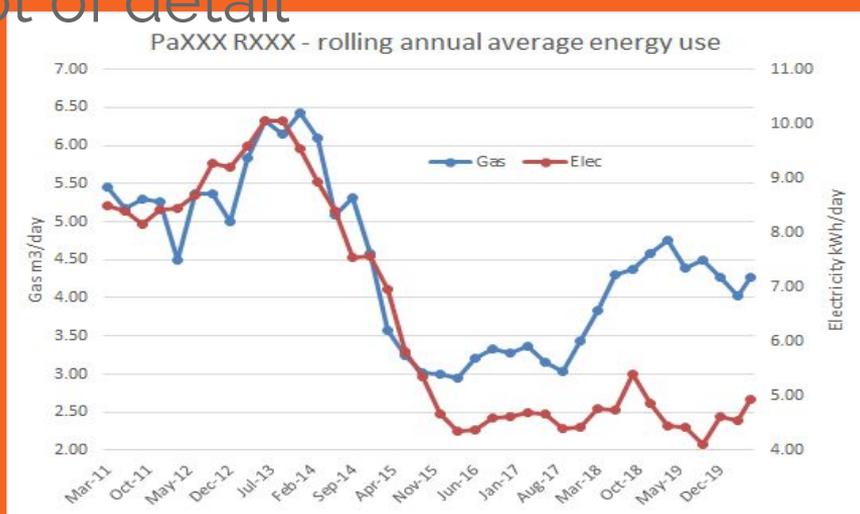
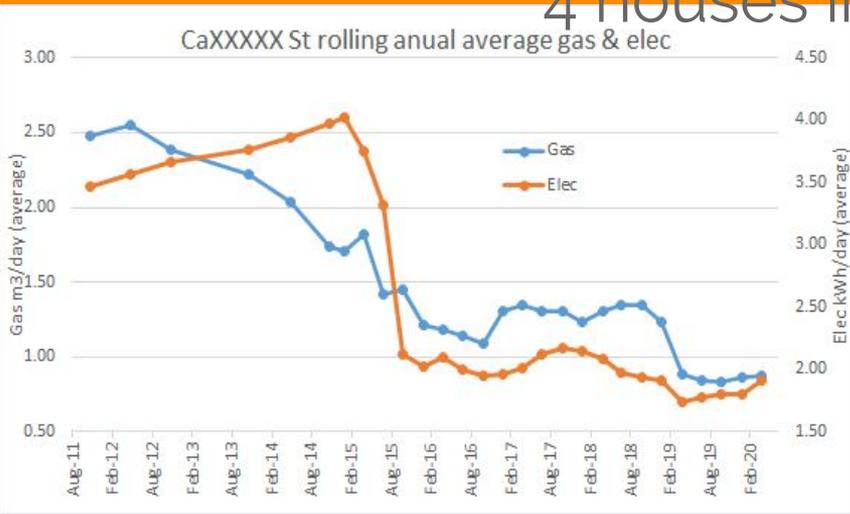


Average temperature goes up

but evening comfort temperature largely unchanged



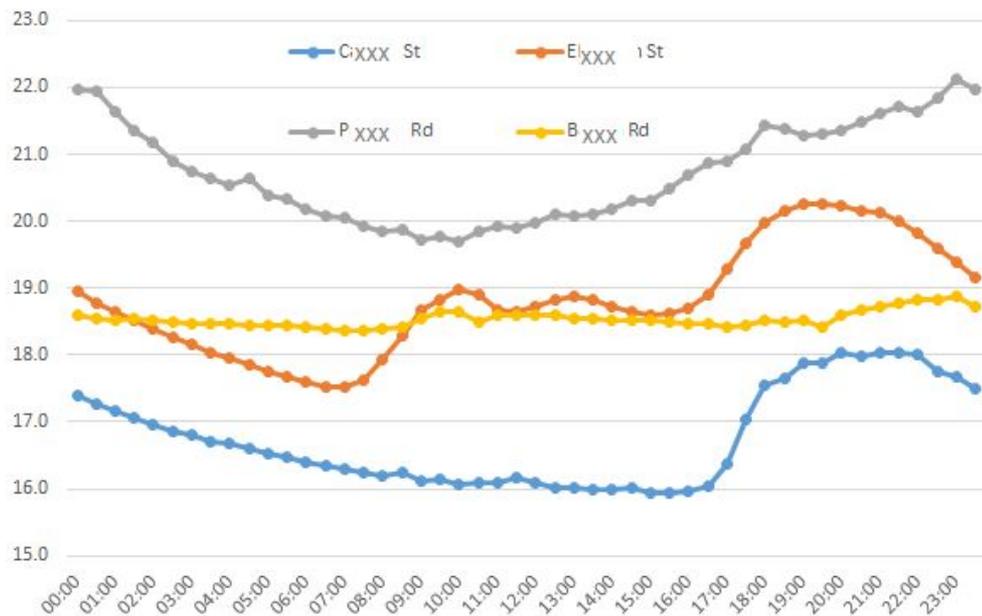
4 houses in a lot of detail





# We are all different

Average Living Room Temperature - Dec 2016



The way we live in our houses is unique to us:

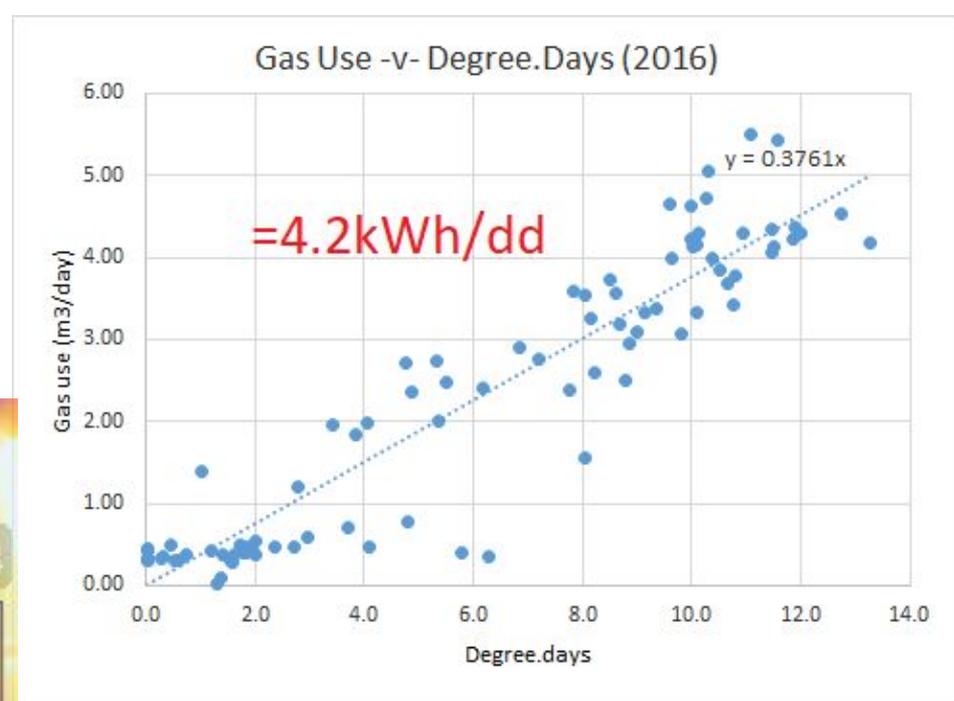
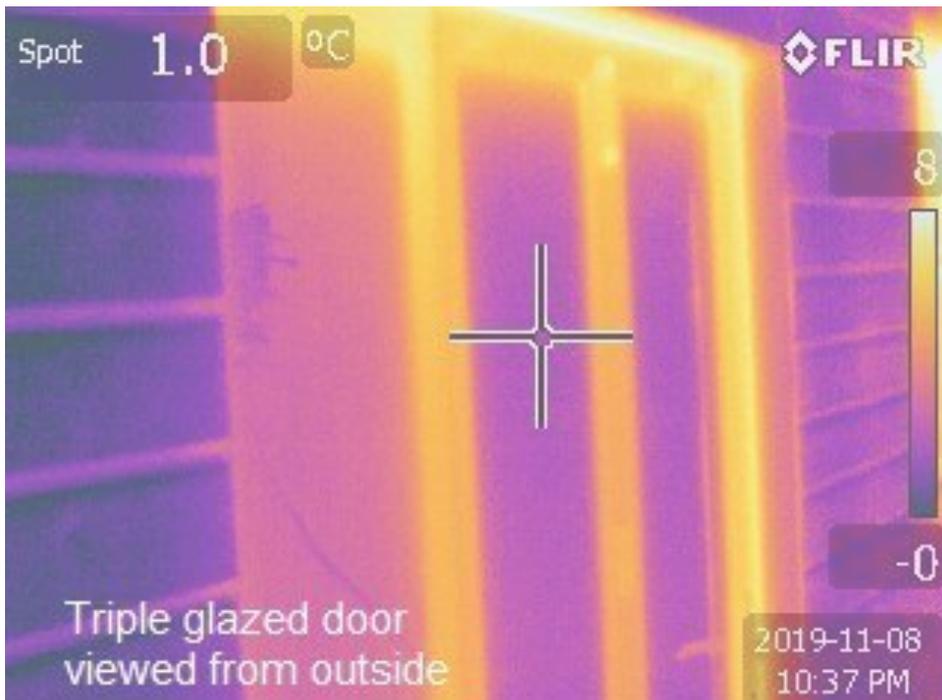
- How
- When
- Who

# My house in a LOT of detail.

Thermal imaging

Delta.T / (heating) degree.days

Lots of other stuff



Monthly

Daily

Seasonal

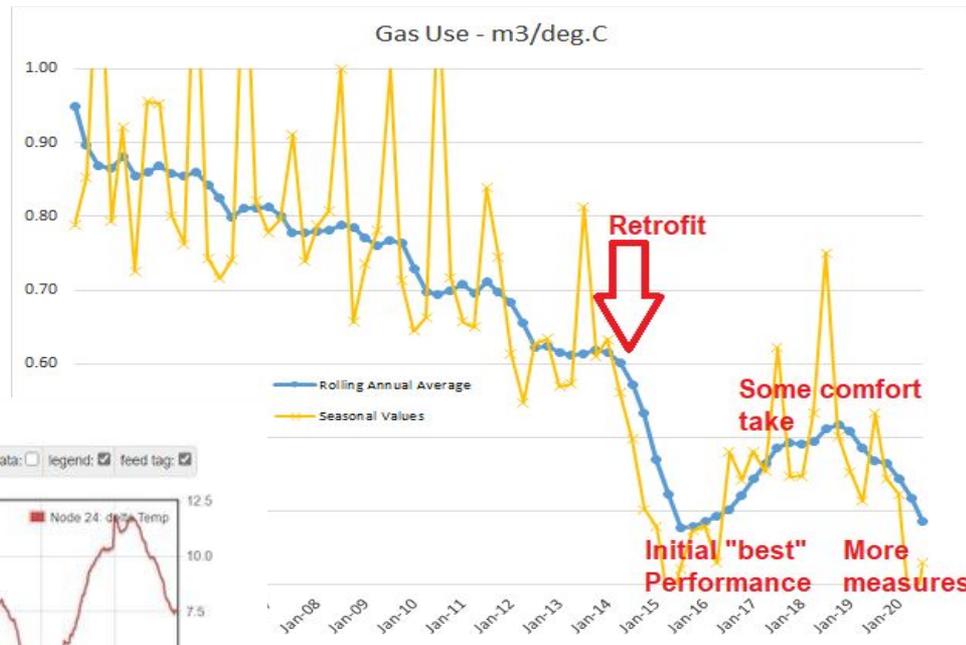
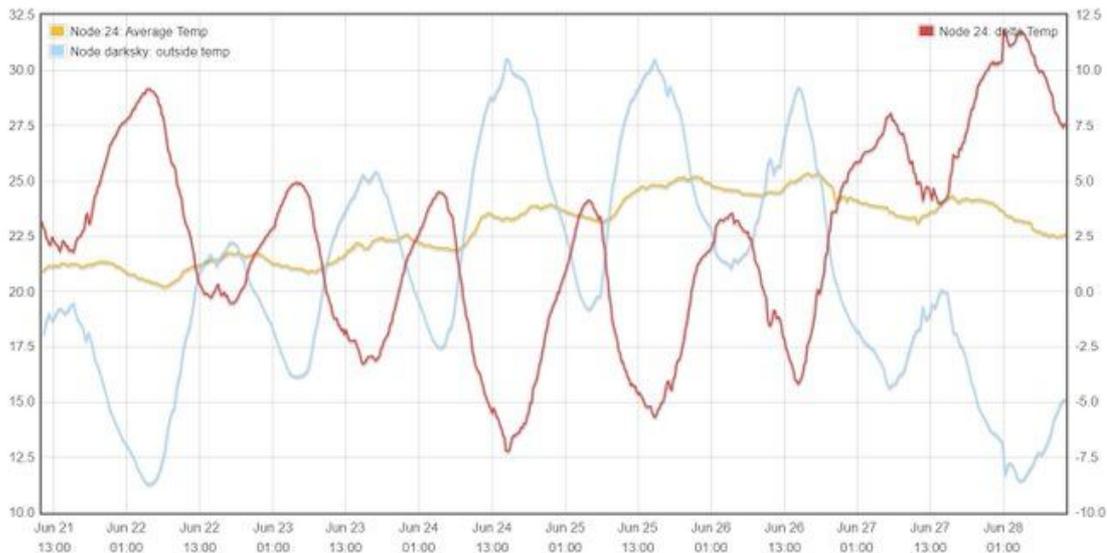
Smart metering

Open energy monitor

—  
You want more  
I've got more

### Data viewer

C 1 Week + - < >



Things that are still tricky to measure / quantify:

- Solar gains
- Passive internal gains
- Internal air-flow / stack effect inside house

# What worked well

Much more liveable houses

External Wall Insulation

Targets broadly met

Triple Glazing / Green Building Store

Solar PV - universally popular

# and less well (risks)

“Under” heating / Target Temperature?

Passive stack ventilation

Need for min temperature gradient



## Tip

Air-tightness needs to be considered up front. On this project it was definitely considered and factored in, but the contract(or) resulted in measures such as detailed air-leakage being missed at the end.



House  
looking good  
for 100 years  
of age.



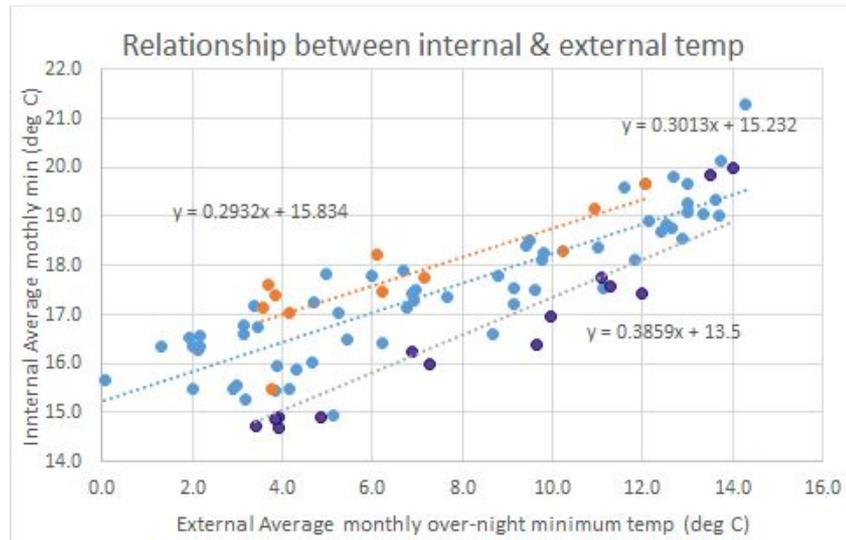
# What Next

Electrification of heat (heat pumps)

Monitoring doesn't stop

Energy Data Co-op / digitisation

People Powered Retrofit



# Questions & Answers

**What did the retrofits cost?**

Corstophine Climate Action

**Trade off between level of air-tightness and U-value and cost?**

Earth Notes Org

**What has it allowed people to do in their home they couldn't before?**

Dr Rose Chard