

# Making Energy Behaviour Research **Relevant to Policy**: *A Tale of Two Studies*

Dr Tim Chatterton, *UWE, Bristol*  
*with*

*Sonja Oliveira, Emily Prestwood, Anush Pogohosyan, Bill  
Gething (UWE) & Flavia Tsang, Peter Burge (RAND)*

It was the best of research.....

.....it was the worst of research

# Presentation

- Overview of 2 evidence reviews undertaken for UK Government (*Department of Energy and Climate Change (DECC)/Business, Energy and Industrial Strategy (BEIS)*)
- What works in changing energy-using behaviours in the home? (2012)
- Heating controls - international evidence base & policy experiences (2017)
- Key findings
- Key lessons arising from the weaknesses in the evidence base
- *Questions of replicability....comparability would be a start*

# Why do a systematic review?

It used to be that if you were writing a review you would stroke your chin and you'd say *"Well I quite like this paper and I quite like that paper and this one's written by my friend, and this one validates my pre-existing prejudices. So I'll just put those into a chapter and write about it."*

- Impartial
- Complete
- Understandable logic
- Comparable results?
- Comparison of quality?

Ben Goldacre TED talks

<http://blog.ted.com/teaching-science-by-bad-example-qa-with-ben-goldacre/>

[https://www.ted.com/talks/ben\\_goldacre\\_battling\\_bad\\_science](https://www.ted.com/talks/ben_goldacre_battling_bad_science)

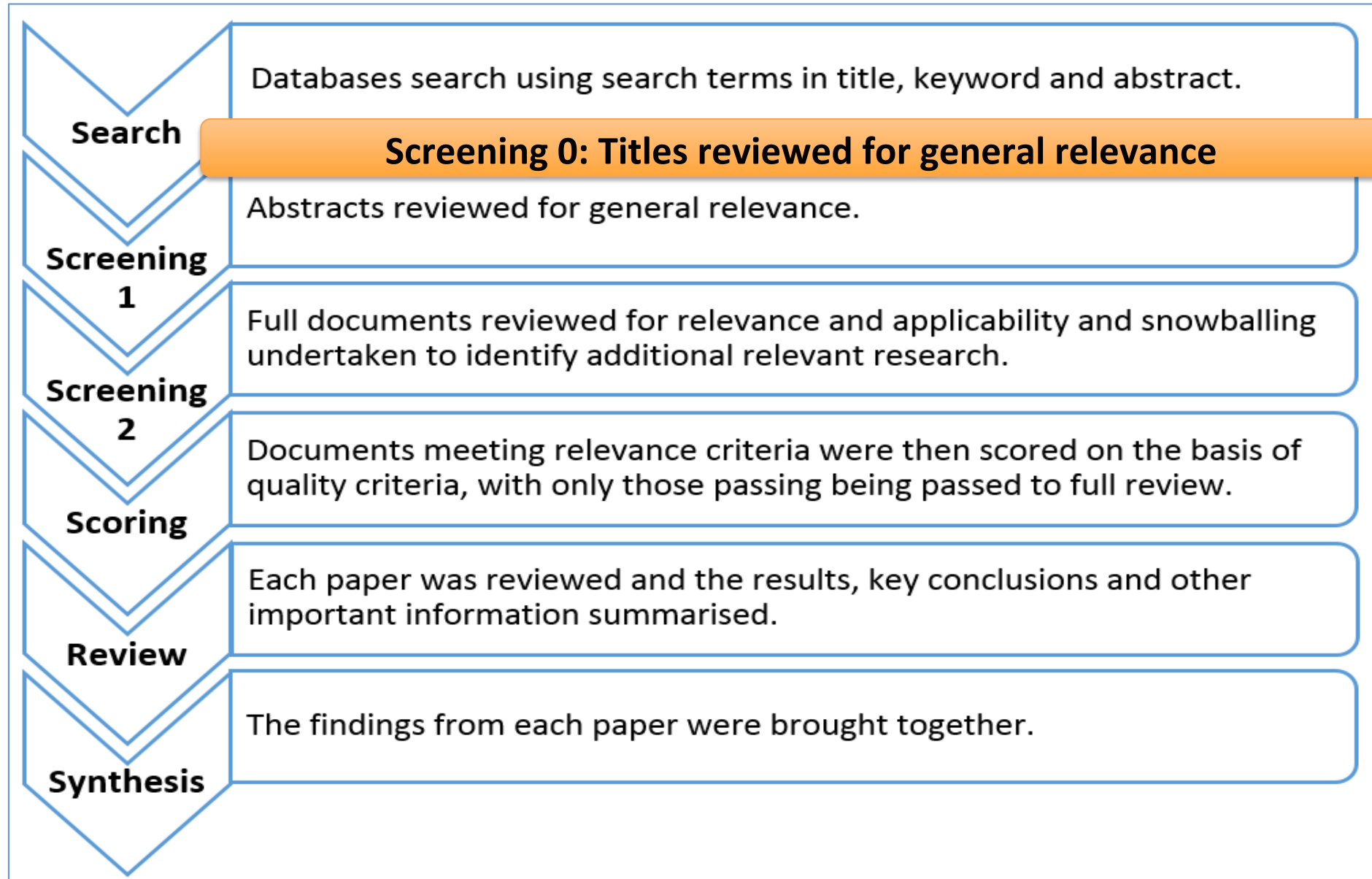


# But.....

- 'Energy behaviour' is not medicine
- Randomised Control Trials are very difficult or not even possible, and hugely limited in what they can tell you
- We know that there are a huge range of psychological, social and cultural factors that cannot be measured, quantified and therefore compared in the way that medical data can
- But that is no reason not to be rigorous in both *producing* and *examining* evidence....

...and targeting it at potential users

# A Systematic Review Process



# Entry into the game....

Make sure your title, abstract and keywords are all appropriate, useful and contain general and specific indicators of the topic of your research.

The title in particular should be clear – not too many puns or jokes!

The abstract should be very informative and include results – do not worry about “plot spoilers”

# Scoring

BEIS's quality assessment scale for Heating Controls review:  
>=6 points needed for review

## Reporting Quality

2 points: *Are the rationale and research questions clear and justified?*

2 points: *Does the document acknowledge resource contributions and possible conflicts of interest?*

1 point: *Are the methods used suitable for the aims of the study?*

## Research Quality

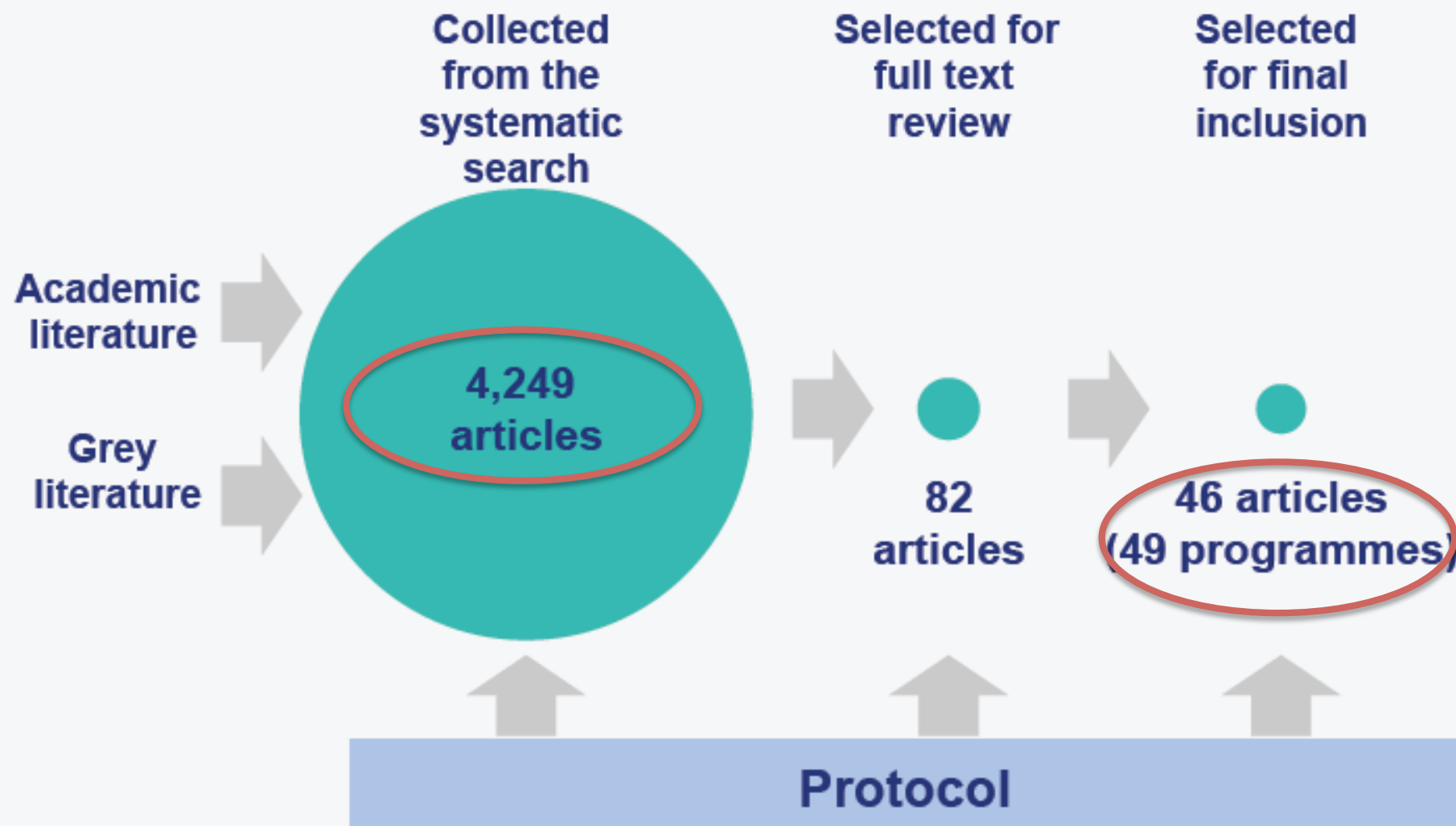
2 points: *Has the document been peer reviewed or independently verified by one or more reputable experts?*

1 point: *Do the conclusions match the data presented?*

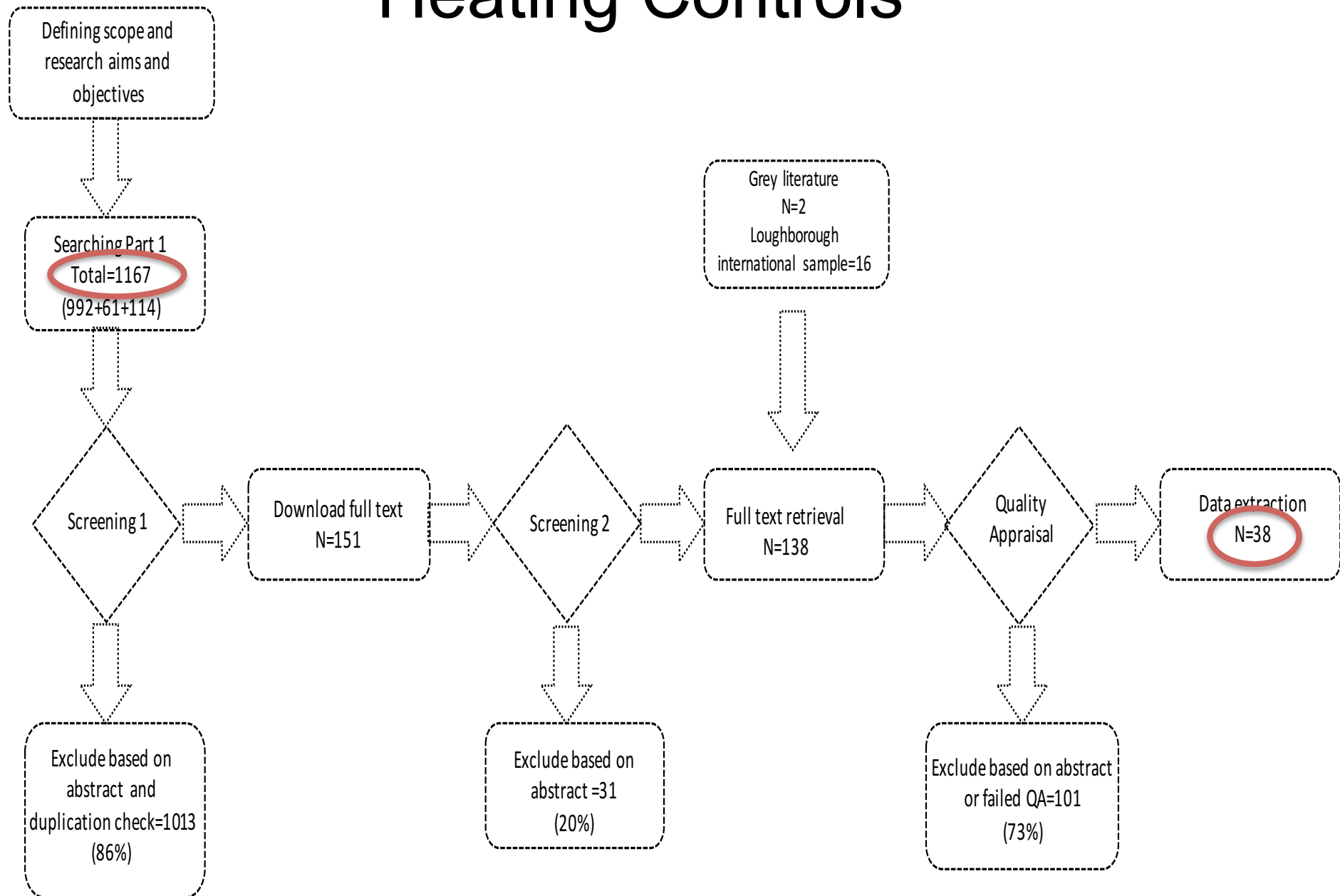
1 point: *Does the author / publishing organisation have a track record in the area?*



# What Works in Changing Energy Behaviour?

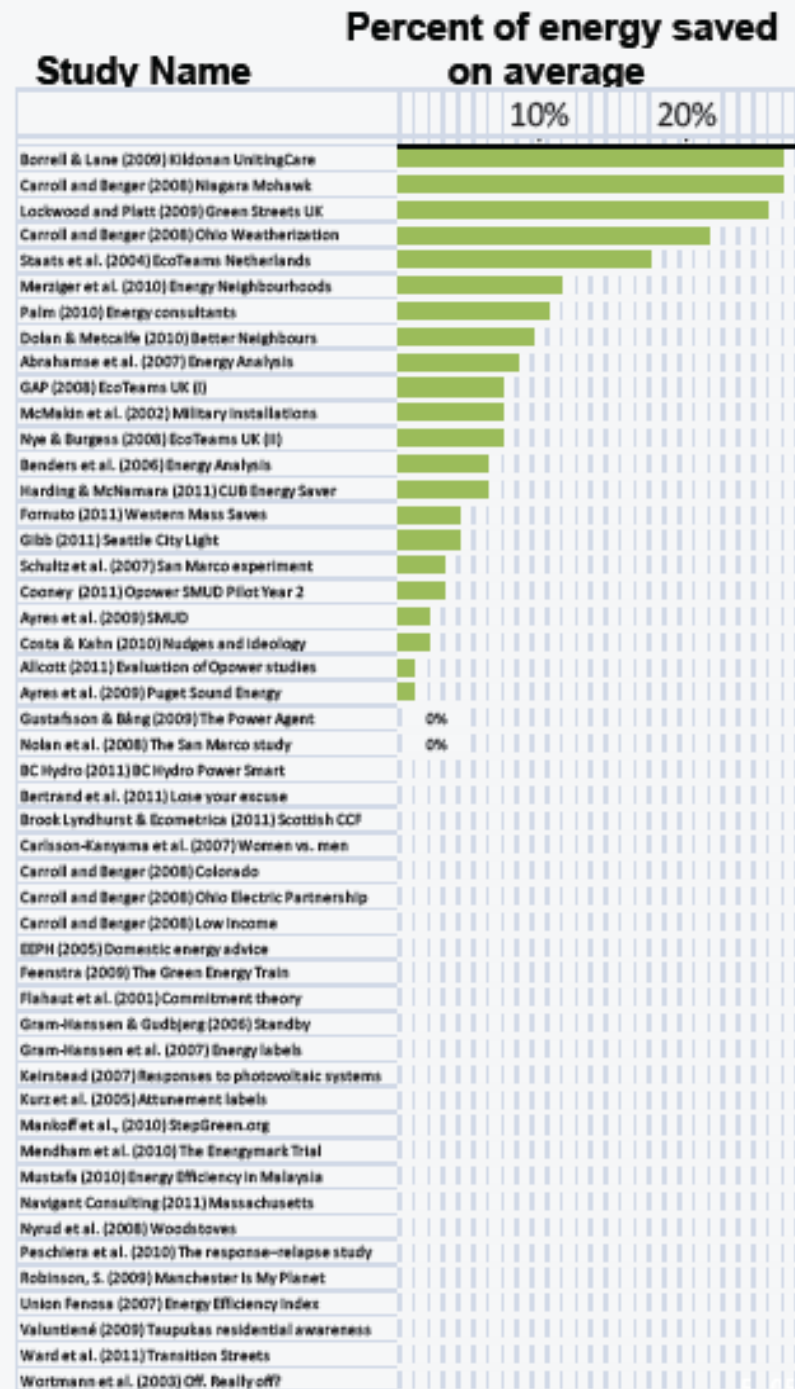


# Heating Controls



# What works in changing energy behaviour?

# What did the evidence say?

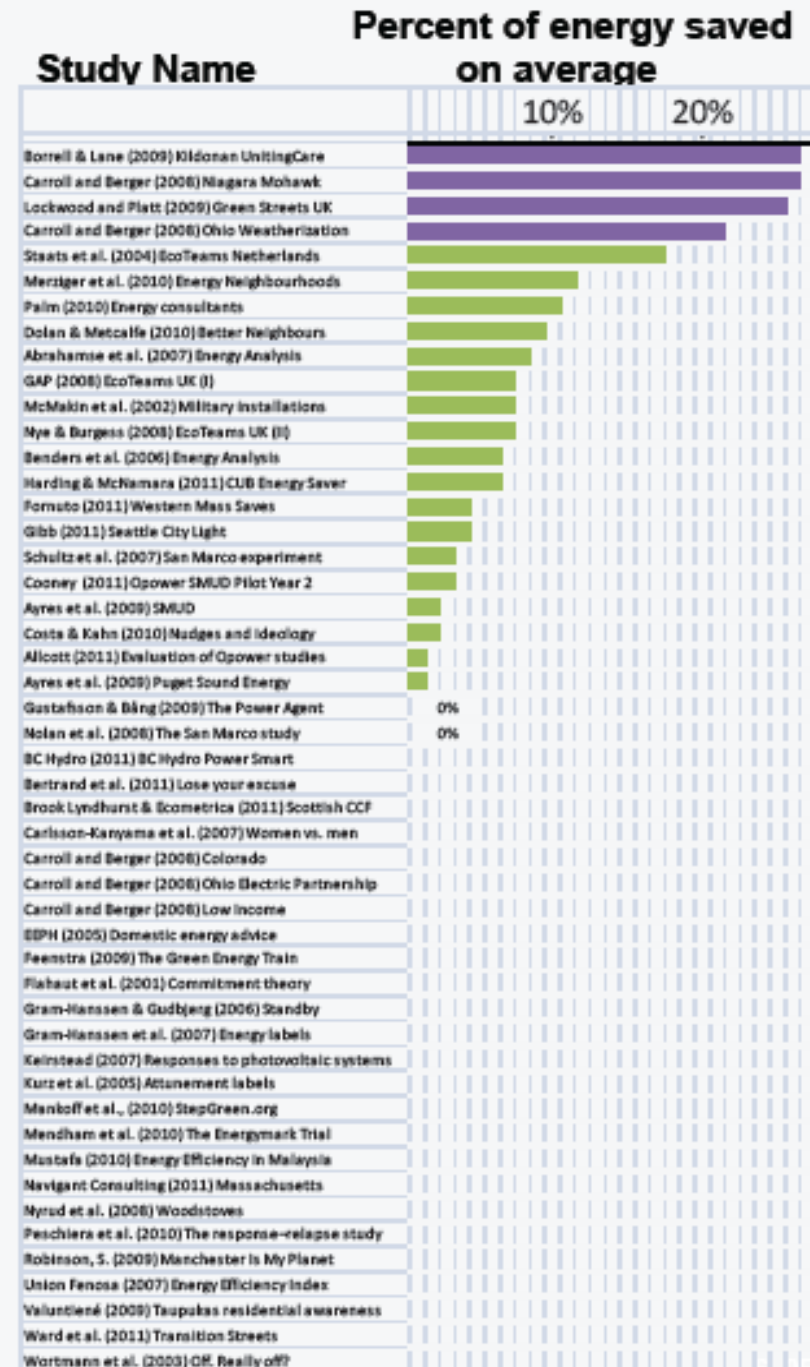


# What did the evidence say?

20+%

- Only possible when behavioural strategies are combined with insulation and/or replacement of appliances

**‘Lock-In’  
or  
‘Moment of Change’?**

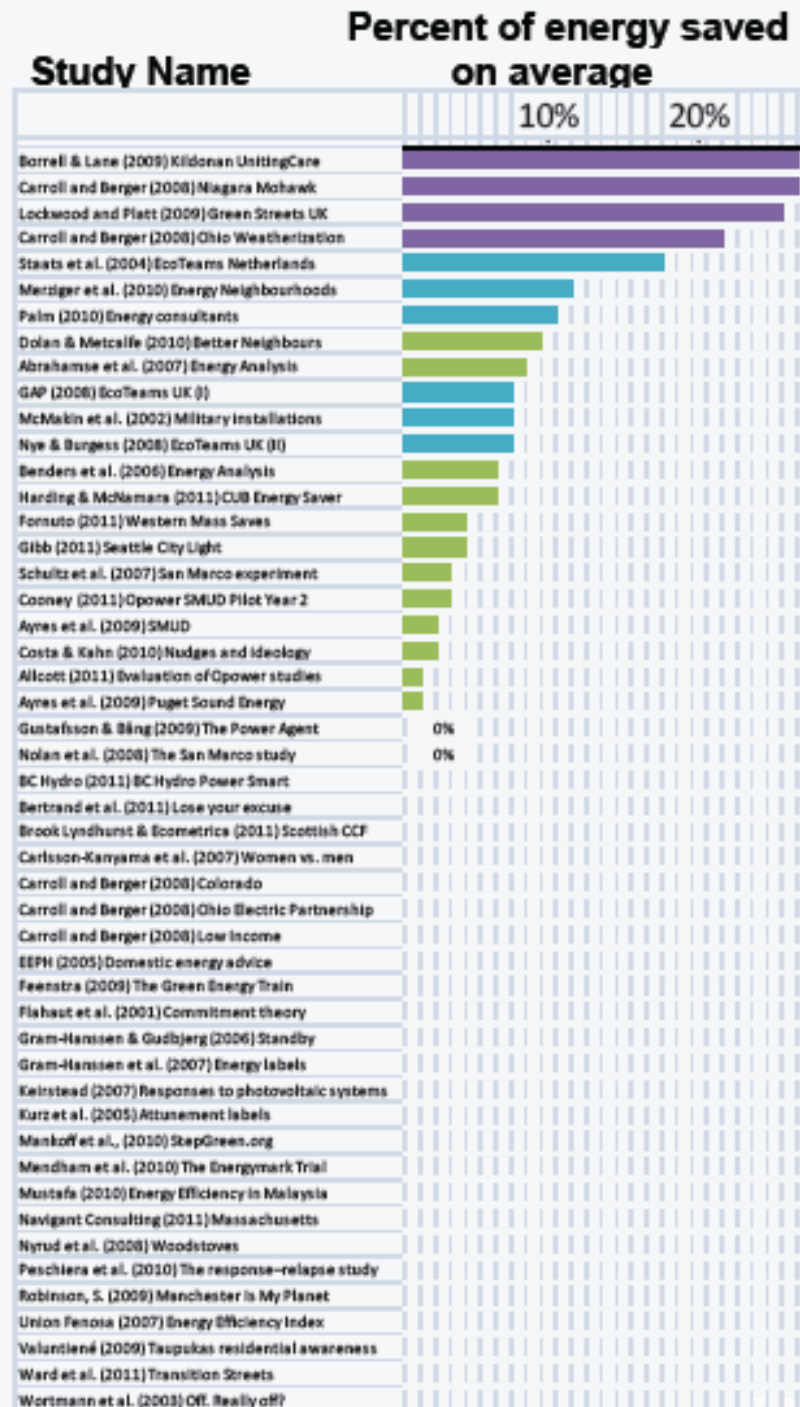


# What did the evidence say?

7%-17%

- Community-based social marketing programmes , e.g. EcoTeams

**Tailored Information  
or  
Personal Contact?**

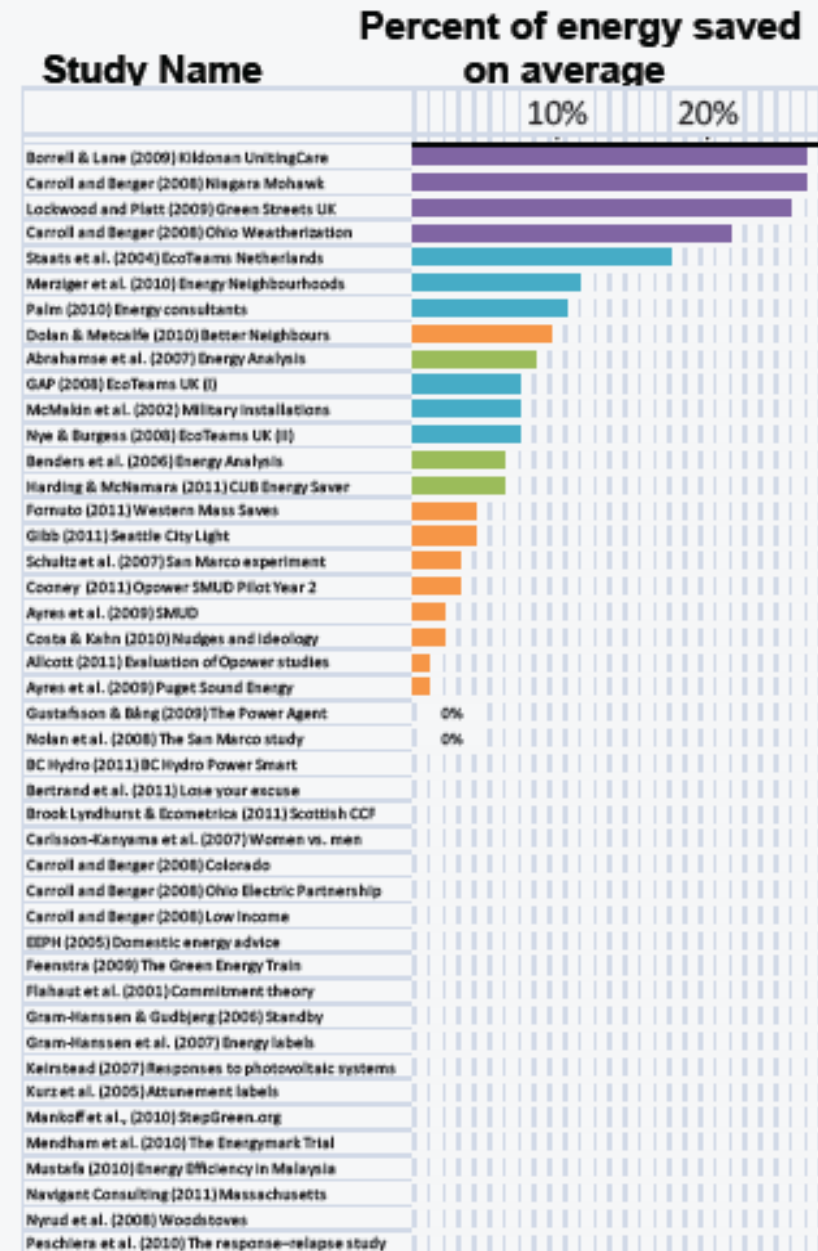


# What did the evidence say?

1-3%

- Feedback + social comparison + instructions, i.e. Home Energy Reports

**Savings 'blackbox'  
on big studies**



**It should be noted though that equivalent size changes in use have been attributed to the Hawthorne Effect!**

Tiefenbeck, V. (2016) On the magnitude and persistence of the Hawthorne Effect – evidence from four field studies, *BEHAVE 2016 4th European Conference on Behaviour and Energy Efficiency* Coimbra, 8-9th September 2016



# Too often the best available evidence is inconclusive

**Energy savings not reported**

- Studies that reported on the different actions participants have taken





# Too often the best available evidence is inconclusive

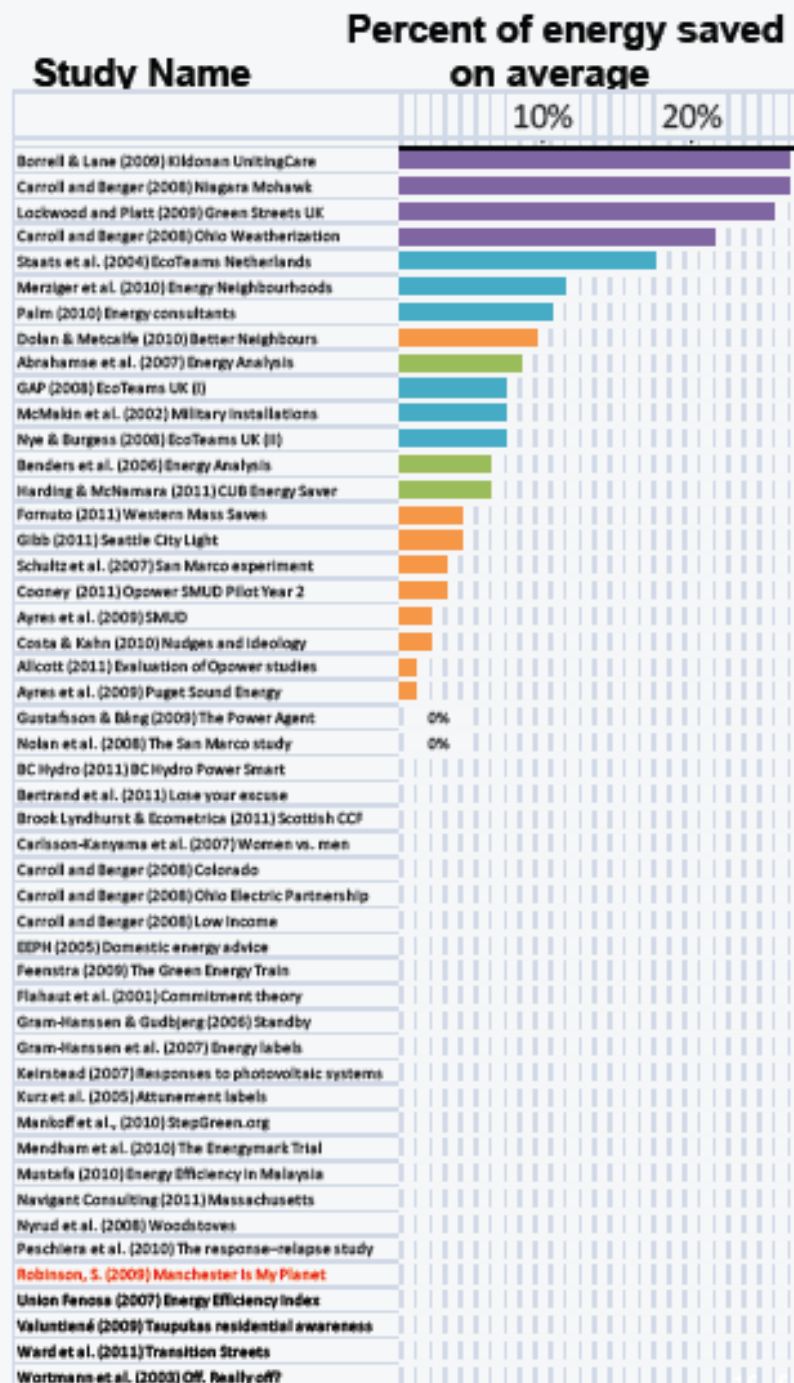
Making a pledge

- One study in Manchester UK reported:
  - “95% of pledgers said that they took actions”

Energy savings  
NOT reported

Reliance on  
self-report

RAND

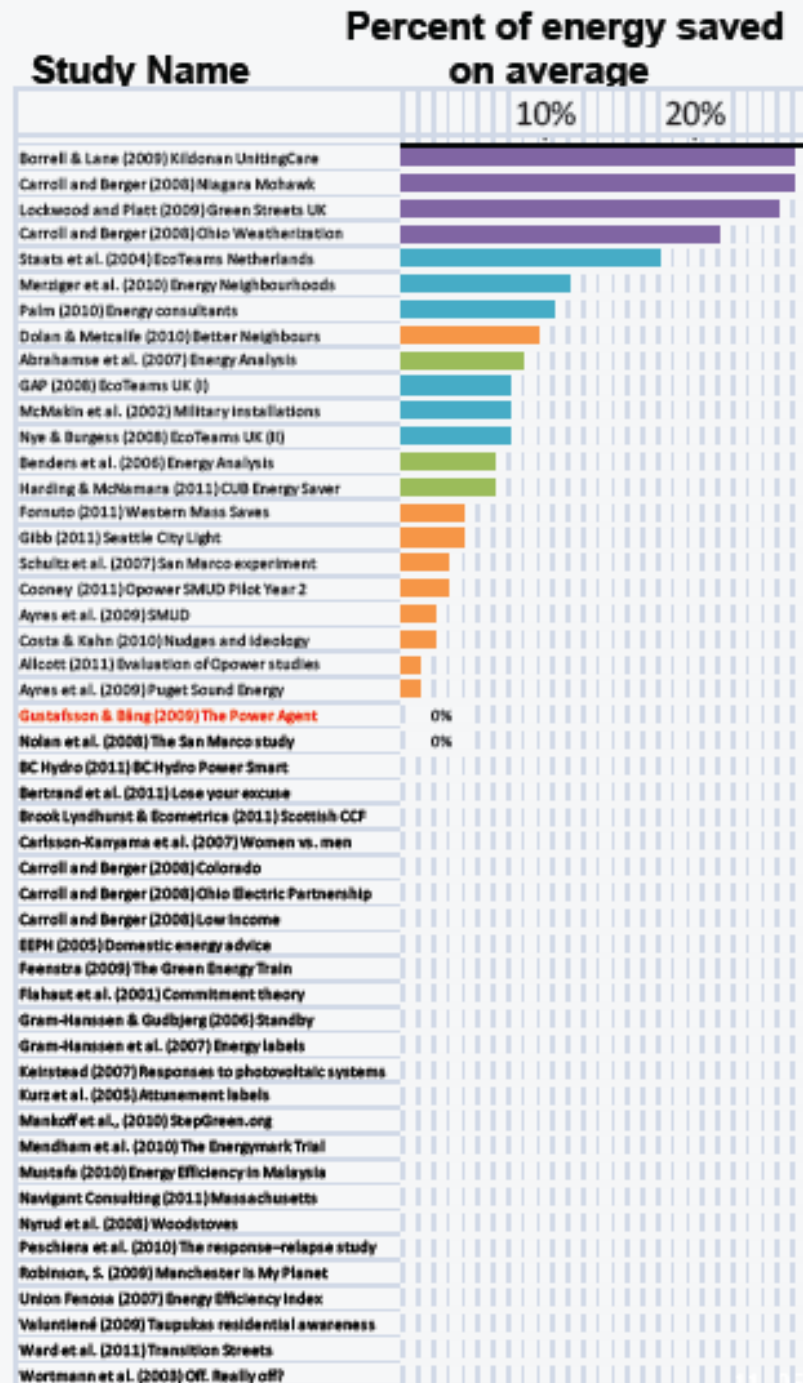


# Too often the best available evidence is inconclusive

Mobile phone based games

- Extreme tactics – that were clearly non-durable - were used by participants
  - e.g. using candles for illumination; ordering pizza instead of cooking at home
- Only 6 teenagers and their families were studied

Insufficient sample size



# Main Weaknesses

- **Lack of independently measured outcome data**
- **Lack of confidence intervals reported on results**
- **Few studies examined the actions underlying observed energy reductions**
- **Few studies reported cost-effectiveness**

# Heating Controls

Cost Savings/Effectiveness

Energy/Carbon Savings

Usability

# They might work but.....

- Lack of data
- Contextual issues with sample
  - Differences in methodology
  - Bias due to convenience sampling
  - Lack of valid control groups
  - Different countries: both climates and practices
  - Different housing types, fuels, heating systems, insulation
- Diverse functionality of designs
- Interactions with other elements of heating system

# To summarise....

- We know very little about what works and why, or by how much
- The policy world knows even less

# Key factors to improve usefulness

- Consideration of local, national and international **policy contexts**
- Reporting of **baseline conditions**, including climate, housing properties, socio-demographics and key behavioural patterns (and assessing the **representivity** of these).
- Making clear distinctions between **fuel types** and **uses**, and information on **standard consumption patterns** (including seasonal variability).
- Providing **quantitative data** on both **baseline** and **changes** to energy consumption.
- Recording of changes in *both* **energy consumption** and **related behaviours**, and linking these to identify the mechanisms for change.
- Assessing the likely **long-term durability** of any effects observed.
- Estimating the **cost-effectiveness** of interventions.

# Thanks!

To you for listening  
and

Peter Warren at BEIS and Anabelle Bonus at DECC for commissioning work, and Charlie Wilson at UEA, and Stephanie Diepeveen, Samuel Drabble and Benoit Guerin at RAND for working on the reviews.

## Reports and Papers

ECEEE Paper: 9-077-17

What Works in Changing Energy Using Behaviours in the Home?

<http://tinyurl.com/DECC-RAND-REA>

Heating controls - international evidence base & policy experiences

**Forthcoming – delayed by UK elections!**

Heating controls journal paper (with BEIS and Loughborough University) under construction

Contact me: [tim.chatterton@uwe.ac.uk](mailto:tim.chatterton@uwe.ac.uk)