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**Opportunities for Postdoc or ECR internships at CAR  
Building an agent-based model to predict energy-efficiency upgrades**

**Objective:**  to build an innovative model that can predict annual take up of different energy efficiency measures in homes

The intended **scope** allow policy-makers to assess different incentives for upgrading energy efficiency in homes: discounts for materials, different tariffs for gas and electricity, discounted council tax/stamp duty, low-cost loans or other incentives. This will inform future energy policies and avoid ineffective government interventions such as the [Green Deal](https://en.wikipedia.org/wiki/The_Green_Deal).

The **approach** is partly probabilistic, recognizing that input data is scarce and incomplete. It will allow refinement over time as improved data becomes available. The approach recognizes that individual household decisions are complex, and competing demands on household finances, attention and time all come into play for significant investment decisions. Life-stage, disposable income and personal priorities are all important, and these vary between households even in the same geographic area. Work stages include:

1 Review of past household energy models and agent-based models for investment decisions.

2 Collating data from Government and other sources (including CAR’s data)

3 Design model – as simple as possible

4 Implement pilot model in Excel

5 Consider other platforms for implementing full model

6 Implement full model and test

The **deliverable** would be a model with a short report justifying modelling decisions.

**Internship** **would suit** Post Docs in engineering, mathematics, or natural sciences, and would suit anyone interested in learning more about reducing energy use and carbon emissions from existing homes, which account for a quarter of the UK’s carbon emissions.

**Dr Jason Palmer** is an engineer with experience in modelling, household energy use, and sustainable construction. He has been a director of Cambridge Architectural Research since 2003.

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