Approaching the Energy Impact Reduction of the National Trust's Conservation Area Holiday Cottages

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'Applying a need for perfection can become the enemy of action; this study highlights the imperative need for balance, combining a detailed understanding with actionable ways forward'

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Introduction:

- **2nd largest** aging housing stock in Europe
- **15% UK houses** pre-1900s
- **2.5% UK emissions** *(eq. Industrial processes)*
- **Trilemma**: Carbon, Conservation and Socioeconomic cost

‘no one-size fits all’

BUT… TO WHAT EXTENT?

The Study:

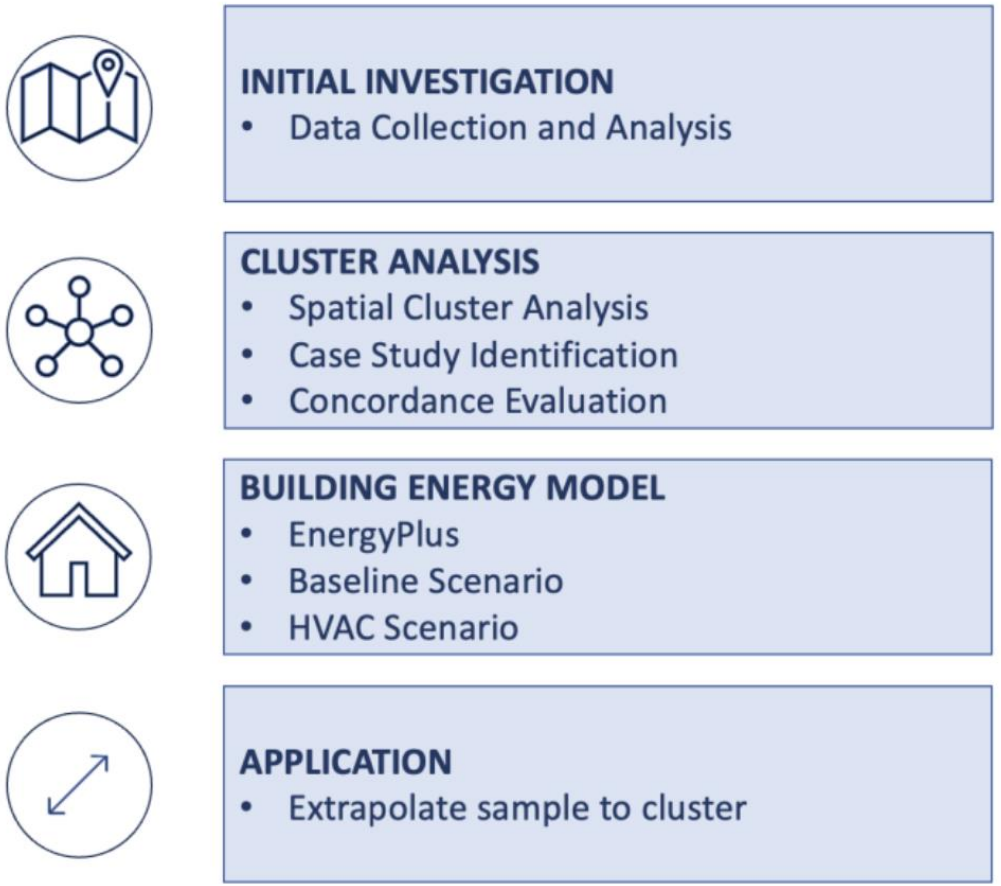
AIM: How can the NT approach reducing the energy impact of its CA holiday cottages in England?

OBJECTIVES:

(1)To explore the feasibility of **small-scale spatial clustering of NT properties** for energy impact reduction.

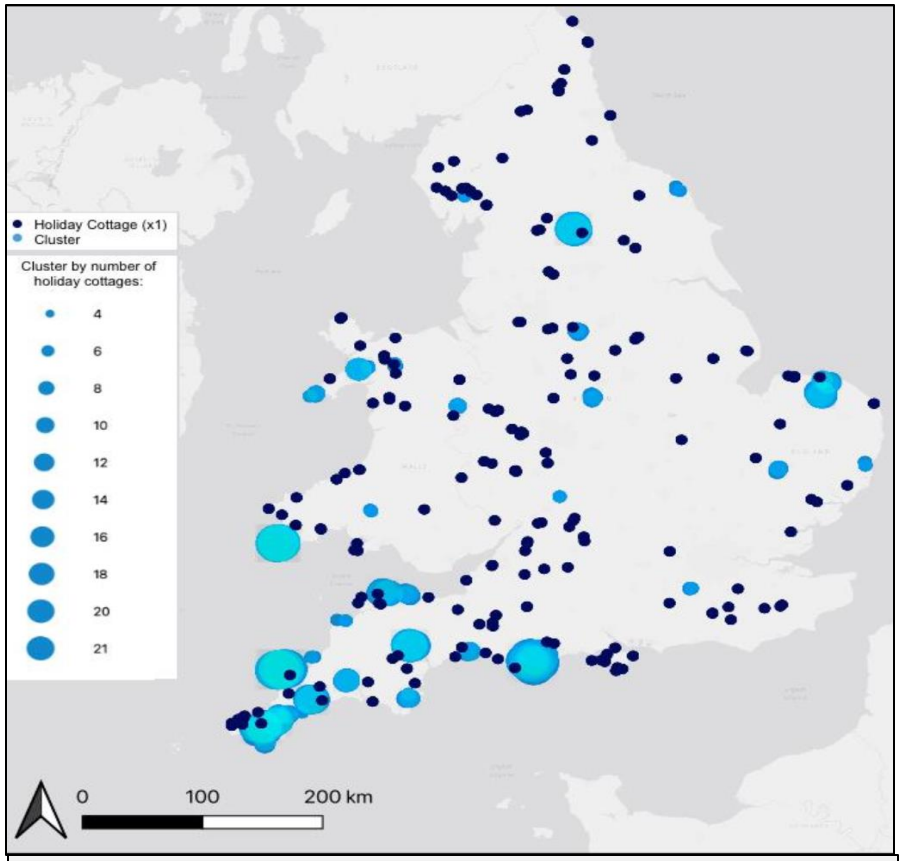
(2)To evaluate a **sustainable mitigation pathway** for energy impact reduction of NT holiday cottages.

Methodology:



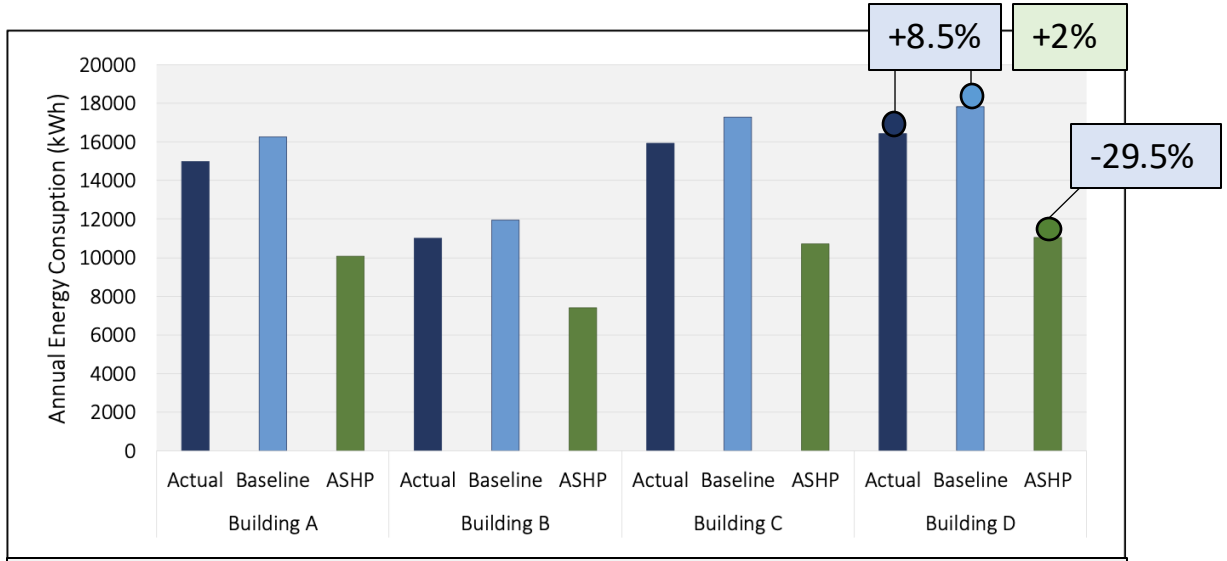
Methodological Design Framework

Results/Discussion:



Spatial clustering analysis of NT holiday cottages in England and Wales.

- **55%** NT HC forming 41 clusters, (4-21 cottages, 247 outliers)
- **68%** exact conformity, with significant linear correlation of EC and floor area.
- **-29.5%** annual energy consumption with ASHP



Annual energy consumption of baseline and modelled scenarios applied to the case study cluster.

Key Findings

Indicative feasibility of small-scale spatial clustering of NT properties for energy impact reduction.

- NT holiday cottage clustering **(55%)**
- Significant homogeneity between households **(68%+)**
- Application viability already in place (NT regional estate managers)

A plausible sustainable mitigation pathway for energy impact reduction of NT holiday cottages.

- Significant reduction in energy consumption with only ASHP application **(30%)**

This study advocates for contextualised generalisation ***contingent upon spatially clustered property concordance.***

Recommendations

Igniting further research…

Key Recommendations:
Recommend: Test of application IRL (post application testing)
Recommend: broader examination of cluster testing to determine the extent of application
Recommend: consideration of building use and installation of ASHP

Continuation of study :

- **Modelling accuracy** for historic buildings (inputs and functionality i.e., **U-values**, **air infiltration**)
- Identification of key **concordance variables**
- **'Holiday mode'** behavioural impacts of HC and energy consumption
- **Central heating system** repercussions in CA or listed buildings.
- **Embodied carbon** impact of retrofitting historic buildings
- Need to consider use, installation