nature portfolio

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Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our Editorial Policies and the Editorial Policy Checklist.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed	
☐	☒	The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒	A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒	The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☐	☒	A description of all covariates tested
☐	☒	A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒	A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☒	☐	For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐	For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐	For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐	Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	No software was used
Data analysis	No code was used. SPSS was used to analyse the data

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our policy

All data generated during this study are included in this article and supplementary files.

Research involving human participants, their data, or biological material

Policy information about studies with human participants or human data. See also policy information about sex, gender (identity/presentation), and sexual orientation and race, ethnicity and racism.

Reporting on sex and gender	Participants were not selected in the study because of their gender. However, gender characteristics of households were collected (self-reported) with informed consent given as it was assumed women may be disproportionately affected by energy poverty than men. This data can be found in the supplementary data. But no analysis was performed here.
Reporting on race, ethnicity, or other socially relevant groupings	Other socially relevant characteristics included age, income type and known health issues. Again, this was self-reported and informed consent was given as it was assumed older, lower income and chronically ill homes are disproportionately affected. This data can be found in the supplementary data. An analysis reported here reveals that homes on social allowance and/or chronically ill are disproportionately affected.
Population characteristics	See above
Recruitment	Homes were opportunity sampled through various ways depending on the intervention. Renovation homes responded to a flyer in the mail asking for research participation. Coaching homes responded to a request by email from the energy coaching services. Subsidy homes requested coaching and agreed to take part in the study upon request. Control homes requested coaching or were found when visiting other treatment homes where neighbours recommended the research request through snowball sampling. This method helped to keep control home characteristics similar to treatment homes. All the homes were low income, with similar demographics living in social housing with low energy labels but even in the same building, within home differences can be vast.
Ethics oversight	AMS Institute and Gemeente Amsterdam

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	A mixed methods naturally occurring experiment was conducted to study the effects of three singular policy interventions that had already been implemented two years prior. All homes had to request or approve the policy intervention in their home themselves.
Research sample	All the homes were low income, with similar demographics living in social housing with low energy labels
Sampling strategy	Homes were opportunity sampled through various ways depending on the intervention. Renovation homes responded to a flyer in the mail asking for research participation. Coaching homes responded to a request by email from the energy coaching services. Subsidy homes requested coaching and agreed to take part in the study upon request. Control homes requested coaching or were found when visiting other treatment homes where neighbours recommended the research request through snowball sampling. This method helped to keep control home characteristics similar to treatment homes.
Data collection	Each visit consisted of 1 hour of data collection, followed by 1hour of energy coaching. Homes received energy products, grocery vouchers, and food packs as renumeration. The subsidies, coaching and renovations serve as our independent variables while the bills, consumption and percentage of income spent, serve as our dependent variables. This included monthly data from January 2020 to December 2024 for 203 homes. Income statements, energy, grocery and rental bills were prepared at home beforehand. However, we also took lidar and thermal scans when visiting the homes to investigate spatial characteristics and heating characteristics that may relate to energy poverty. Lidar and thermal scans were done side by side and hand in hand during the home visit. This took approximately 10 minutes using a Flir thermal camera and an iPhone 12 pro. Moreover, interviews gathered socio-demographic information (i.e. age, income type), but also asked the same 8 open ended questions about their evaluation of the policy. This ranged from; 'Can you tell me about your experience with the intervention' to 'What can the municipality do to improve the policy to make sure your needs are met?'.
Timing	Data collection began on February 1st 2025 and ran until August 3rd 2025.
Data exclusions	Some data in the supplementary file was not analysed due to the research scope. Other variables (i.e. grocery bills) were more important and we assumed they would change due to the policy intervention rather than background ones (i.e. cooking type gas or electric) which were not as relevant.
Non-participation	No participants dropped out. However, some eligible homes did not participate due to time constraints.

Randomization

Randomised control trial were not possible with this study design.
Therefore the randomization of assignment between treatment groups is not assured.
The study had homes either apply for, or accept the intervention at will.
Low-income homes may be too sensitive to randomise for ethical and legal reasons,
especially if conducting research under the aims of a socially just energy transition.
These interventions are closer to 'naturally occurring experiments' that would happen
with or without the mediation of a researcher, as there were active policies in place.
Ultimately, these interventions are decided by national to district level governments..

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern
☒	☐ Plants

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Plants

Seed stocks

Report on the source of all seed stocks or other plant material used. If applicable, state the seed stock centre and catalogue number. If plant specimens were collected from the field, describe the collection location, date and sampling procedures.

Novel plant genotypes

Describe the methods by which all novel plant genotypes were produced. This includes those generated by transgenic approaches, gene editing, chemical/radiation-based mutagenesis and hybridization. For transgenic lines, describe the transformation method, the number of independent lines analyzed and the generation upon which experiments were performed. For gene-edited lines, describe the editor used, the endogenous sequence targeted for editing, the targeting guide RNA sequence (if applicable) and how the editor was applied.

Authentication

Describe any authentication procedures for each seed stock used or novel genotype generated. Describe any experiments used to assess the effect of a mutation and, where applicable, how potential secondary effects (e.g. second site T-DNA insertions, mosiacism, off-target gene editing) were examined.