



Home Energy Efficiency Upgrade Program

FINAL REPORT



Australian Government
**Department of Industry,
Innovation and Science**



Brotherhood of St Laurence
Working for an Australia free of poverty

The Brotherhood of St Laurence is a non-government, community-based organisation concerned with social justice. Based in Melbourne, but with programs and services throughout Australia, the Brotherhood is working for a better deal for disadvantaged people. It undertakes research, service development and delivery, and advocacy, with the objective of addressing unmet needs and translating learning into new policies, programs and practices for implementation by government and others. For more information, visit <www.bsl.org.au>.

The Home Energy Efficiency Upgrade Program (HEEUP) is a trial funded by the Commonwealth Department of Industry, Innovation and Science. The views expressed herein are not necessarily the views of the Commonwealth of Australia, and the Commonwealth does not accept responsibility for any information or advice contained herein.

Multiple authors have contributed to this report. Please cite the authors as below:

For the Summary, Section 1, Section 3.1, Section 4, Section 5.2, Section 7:

Sullivan, D 2016, *Home Energy Efficiency Upgrade Program: final report*, Brotherhood of St Laurence, Fitzroy, Vic.

Section 2 and Appendix F:

Byrne, G, Jorgensen, B, Jungbluth, L & Smith, L 2016, 'What was the effect of the Home Energy Efficiency Upgrade Program (HEEUP) on household electricity and gas consumption?' in D Sullivan 2016, *Home Energy Efficiency Upgrade Program: final report*, Brotherhood of St Laurence, Fitzroy, Vic.

Section 3.2 and Appendix G:

Ward, M & Brent, D 2016, 'Discrete choice experiment, results and analysis for Home Energy Efficiency Upgrade Program (HEEUP)', in [as above]

Section 5.1 Research case studies:

Johnson, V & Sullivan, D 2016, 'Home Energy Efficiency Upgrade Program (HEEUP) research case studies', in [as above]

Section 6 and Appendix H:

O'Mullane, L & Hoch, L 2016, 'Home Energy Efficiency Upgrade Program (HEEUP) cost-effectiveness and cost-benefit analyses', in [as above]

Photography by Cara Bradley

Brotherhood of St Laurence
67 Brunswick Street
Fitzroy, Victoria 3065
Australia

ABN 24 603 467 024

Ph: (03) 9483 1183

www.bsl.org.au

Contents

Acknowledgements	vi
A note on terminology	vii
Executive summary	viii
HEEUP delivery outputs	viii
HEEUP research	ix
Major recommendations	xiii
Other recommendations	xiv
1 HEEUP overview	1
Introduction	1
HEEUP research	2
Who was involved in implementing HEEUP?	3
What did the HEEUP trial involve?	5
HEEUP for owner occupiers	6
Community housing	11
Who HEEUP assisted, when and how	13
HEEUP's installation geography	15
HEEUP by installation stream	16
Types of installations	16
Hot water systems and upgrade pathways	18
2 What was the effect of HEEUP on household electricity and gas consumption?	21
Summary of results	21
Introduction	22
Methodology	27
Household, behavioural, employment and income characteristics	28
Intervention	30
Upgrade pathways	34
Analysis preliminaries	35
The analysis model	36
Results	37
Overall effect of HWS upgrades	38

Effect of selected upgrade paths	38
Discussion	42
Conclusion	48
3 What is the optimal incentive level to promote a switch to an efficient system?	49
PROGRAM DELIVERY EXPERIENCE	49
Summary of results	49
Introduction	49
Data and methodology	49
Results	50
Discussion	54
DISCRETE CHOICE EXPERIMENT, RESULTS AND ANALYSIS FOR HEEUP	56
Summary of results	56
Introduction	57
Overview of objectives and methods	57
Survey design	58
Sample characteristics and summary of survey responses	63
Discrete choice analysis	66
Decision-support tool	70
Limitations	75
4 Did HEEUP change purchasing decisions?	76
HEEUP SURVEY AND INSTALLATION RESULTS	76
Summary of results	76
Introduction	76
Data and methodology	77
Results	77
Discussion	79
Further research	79
5 What lessons were learnt from the program, what were the enablers?	80
RESEARCH CASE STUDIES	80
Summary of results	80
Research framework	81
Research design	82

Points illustrated in the case studies	84
The participant case studies	87
REFLECTIVE PRACTICE	109
Introduction	110
Data	110
Summary of sessions	110
6 Cost-effectiveness and cost benefit analysis	117
Summary of results	117
Introduction to cost-effectiveness and cost-benefit analysis	122
HEEUP four cost-level analysis	129
Cost-effectiveness analysis and cost-benefit analysis	134
7 Conclusion	148
Major recommendations	148
Other recommendations	149
8 Appendices	152
Appendix A: HEEUP program materials	152
Appendix B: HEEUP steering committee	158
Appendix C: Administrative data – client monitoring system (CMS)	160
Appendix D: Questionnaire – demographic and dwelling data	162
Appendix E: Demographic and dwelling data	175
Appendix F: Effect of HEEUP on household energy consumption	212
Appendix G: Discrete choice experiment	223
Appendix H: Data for cost-effectiveness and cost benefit analysis	236
Appendix I: Budget	270
9 References	272
References: HEEUP overview (Chapter 1)	272
References: Energy savings (Chapter 2)	272
References: Discrete choice experiment (Chapter 3)	274

Acknowledgements

The Home Energy Efficiency Upgrade Project was led by the Brotherhood of St Laurence and relied on collaboration between consortium partners (AGL, Monash Sustainability Institute, NSW Office of Environment and Heritage and ATA); suppliers (EnviroGroup, Sanden, NewGen Solar); community housing groups; and others such as the Hume City Council. AGL and MSI were particularly important to the final success of the project.

HEEUP was made possible by \$4.5 million in funding from the Commonwealth Government's Department of Energy Efficiency and Climate Change Low Income Energy Efficiency Program (LIEEP).

A committed team of people contributed to the success of the project.

We especially acknowledge the late Dr Gill Owen who provided wonderful guidance as part of the HEEUP Steering Committee in the early part of the project and whose sharp insights were missed following her departure from the group due to ill health. John Thwaites also provided helpful advice in the development of the project.

HEEUP benefited from the skills of dedicated staff, notably the project manager Halley McCann, Hugh Bartram, Tony Robinson, David Low and an enthusiastic team of engagement and administration officers. Commonwealth Department of Industry staff including Angela Clark, Simon Byrne and Gene McGlynn provided important oversight. The project reference group, including Liam Smith (Monash University), Lauren Solomon (AGL), Jenny Wood (NSW Office of Environment and Heritage) and Damien Moyse (ATA), also provided valuable input.

We are grateful for the expertise of researchers who undertook discrete components of the research: Graeme Byrne, Bradley Jorgensen, Lena Jungbluth and Liam Smith (Behaviour Works Australia, Monash Sustainability Institute, Monash University); Michael Ward and Danny Brent, Monash University Department of Economics; and Linda O'Mullane and Lance Hoch (Oakley Greenwood).

The photographs that complement the case studies were taken by Cara Bradley.

This report benefited from the contributions of Dr Victoria Johnson and Deborah Patterson (editor) and from review by HEEUP project staff.

A note on terminology

The term 'participants' (without qualifier) is used throughout this report to describe the households (or individuals in them) that proceeded to install a new hot water service during HEEUP. Where the people that expressed an interest in or received a home visit under HEEUP are also included, that is specified in the text.