Journal of Environmental Management 187 (2017) 89–95

Contents lists available at ScienceDirect

Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman

Research article

# Facilitating adaptive management in a government program: A household energy efficiency case study

Jim Curtis [a, *], Alex Graham [b], Eraj Ghafoori [a], Susan Pyke [c], Stefan Kaufman [d], Mark Boulet [a]

[a] BehaviourWorks Australia, Monash Sustainable Development Institute, 8 Scenic Boulevard, Monash University 3800, Victoria, Australia
[b] Office of Environment and Heritage, PO Box A290, Sydney South 1232, New South Wales, Australia
[c] Office for Environmental Programs, Wilson Avenue, The University of Melbourne, Parkville 3010, Victoria, Australia
[d] Environment Protection Authority Victoria, GPO Box 4395, Melbourne 3001, Victoria, Australia

ARTICLE INFO

*Article history:*
Received 30 March 2016
Received in revised form
17 October 2016
Accepted 15 November 2016

*Keywords:*
Adaptive management
Public policy
Household energy efficiency
Behavior change

ABSTRACT

Interim evaluations of government programs can sometimes reveal lower than expected outcomes, leading to the question of how adjustments can be made while the program is still underway. Although adaptive management frameworks can provide a practical roadmap to address this question, a lack of successful learnings and poor implementation have hampered the progress and wider application of adaptive management. Using a case study involving an energy efficiency government program targeting low-income households, this article provides supporting evidence on how adaptive management can be facilitated and applied. Factors such as proactive and responsive leadership, establishing a research-practice interface, and recognizing the skills, expertise, and contributions of multiple stakeholders guided adjustments to the program, and later paved the way for longer-term organizational learning that impacted how other programs are delivered. Implications for knowledge and practice, and a discussion of the challenges faced in the program, advance current thinking in adaptive management.



## 1. Introduction

The growing demand for a more sophisticated understanding of government interventions, where attributions are realistically assessed, has been at the forefront of recent governmental strategic thinking and evidence-based policy efforts (Bovaird, 2014; Head, 2008; Langlois et al., 2016). Across a number of democracies, comprehensive work is underway to systematically integrate evidence into program development and implementation, articulating how high-level policy outcomes are to be planned, supported, delivered, and measured. However, rather than applying simple end-of-program metrics as measures of success, which admittedly can be "seductive" through the sense of precision they convey, flexible and ongoing reflections during program delivery provide a better opportunity to understand the anticipated and unanticipated complexities of program implementation, with such understandings allowing programs to be adjusted and managed more effectively. The unrealistic expectation of a simple answer for a complicated question is therefore replaced by an analysis that looks for feedback loops, emergent features, and unexpected outcomes (Head and Alford, 2015; Perrin, 1998).

With this in mind, increasing attention is being paid to providing better program delivery in complex policy environments through process evaluations (Moore et al., 2015; Steckler and Linnan, 2002). This typically involves examining the extent to which a program is being delivered as it was intended, and the positive or negative impacts this is having on the attainment of the program's overall objectives through interim outcome evaluations. Such a process is carried out while the program is still underway, and is guided by a managerial willingness and ability to adjust the program if required. The implication is that those in the role of central accountability should be demanding this kind of evaluation in government programs tackling complex problems, so that the insights gained are used to determine how the implementation of the program could be improved (Owen and Rogers, 1999). To this end, process evaluations can be used to identify the need for an adaptive management response (Moore et al., 2015), and is most likely triggered when lower than expected outcomes are apparent, offering opportunities for change, rather than blame.

* Corresponding author.
*E-mail address:* james.curtis@monash.edu (J. Curtis).

http://dx.doi.org/10.1016/j.jenvman.2016.11.033
0301-4797/

Adaptive management responses are appropriate for dealing with scenarios where the level of uncertainty and program control are both high (Allen et al., 2011; Rehme et al., 2011). Instead of considering policies as irrefutable programs, adaptive management suggests approaching policies as learning opportunities and refutable hypotheses that have an inherent nature to change and to improve based on the feedback provided through actions (Clark, 2002). While there are various interpretations and frameworks of adaptive management, Allen et al. (2011) describe a process that involves both a structured decision making component and an opportunity to learn. The former entails definition of the initial problem, identification of program objectives, the formulation of evaluation criteria, the estimation of desired outcomes, an assessment of trade-offs, and decisions related to the intended interventions. The learning component involves the implementation (or piloting) of the interventions, the monitoring and evaluation of outcomes, and identifying necessary adjustments to the program if required. These learnings then feed back into the structured decision-making process (Allen et al., 2011).

While adaptive management has been referenced either implicitly or explicitly for more than three decades, there has remained an imperfect realization of adaptive management in real world settings. Studies by Allen et al. (2011), Allen and Gunderson (2011), Johnson and Williams (1999), and Williams and Brown (2013) identify several factors contributing to this challenge, including: (1) management, policy and funding paradigms that favor reactive rather than proactive approaches, (2) a lack of resources, technical expertise, and support to translate new learnings into practice, (3) institutional resistance and risk aversion to uncertainty and shifting program objectives, (4) false or overconfident assumptions on what will work, (5) a reluctance to meaningfully engage different stakeholders in decision-making, and (6) a lack of institutional commitment for additional monitoring and evaluation to determine the effectiveness of adaptive management decisions. In combination, these barriers have slowed the development of adaptive management, with examples of successful approaches remaining relatively infrequent (Allen et al., 2011; Allen and Gunderson, 2011; Scarlett, 2013; Williams and Brown, 2013).

Given this situation, there is a strong need for evidence and contemporary case studies that demonstrate how some of these adaptive management impediments have been addressed in real-world program examples, specifically in the social or human domain (Williams and Brown, 2013). In this article, a case study is presented that shows how a large-scale household energy efficiency government program was adapted following an interim evaluation, and the critical factors that facilitated this process. The article draws on current thinking in adaptive management to reflect on how the adjustments that were made to the program's delivery were facilitated by a number of critical factors. These factors counter some of the common barriers to adaptive management, contributing not only to the literature, but also to practice, as the target organization that is the subject of this case has since implemented adaptive management as its new model for program delivery.

## 2. Phases of adaptive management in the Home Power Savings Program

### 2.1. Program background

To illustrate how a large government program was adaptively managed midway through its implementation, this article uses the case of the Home Power Savings Program in the state of New South Wales (NSW), Australia.

The 2007 Owen Inquiry, commissioned by the NSW state government, estimated that over 80% of cost-effective energy efficiency opportunities would not be realized without public policy interventions, and that energy efficiency should play a significant role in helping the government achieve its energy policy objectives (Owen, 2007).

In response to the Owen Inquiry, a number of initiatives and opportunities to support businesses, households, and communities to reduce energy use were articulated in a subsequent NSW government strategy (NSW Government, 2011). One of these initiatives specifically targeted low-income households, which would later become known as the Home Power Savings Program (HPSP). The program, administered by the NSW Office of Environment and Heritage (OEH), aimed to help low-income households reduce their energy use by up to 20% (ARTD Consultants, 2012; NSW Government, 2011). The program was designed to address common barriers faced by low-income households, specifically the limited capital for basic energy efficiency upgrades, a lack of understanding of home energy use, and a lack of information about energy efficient behaviors (Romanach et al., 2014; Vassileva and Campillo, 2014).

HPSP commenced in 2010 and finished in 2014. It provided eligible households with three services: (1) a 1-h in-home energy assessment by an authorized assessor, (2) a Power Savings Kit of energy efficient products, fully installed by the assessor,[1] and (3) information on low cost ways for the household to save energy. While a large number of government energy efficiency programs in Australia have targeted households in the past, none had specifically targeted low-income households to the scale of HPSP at the time of its delivery, with the ambition of delivering 220,000 home assessments at a cost of AUS$63 million.

### 2.2. Interim process evaluation

In 2012, approximately midway through the delivery of HPSP, OEH commissioned an independent evaluation to identify whether the program was tracking towards meeting its goals by assessing interim results related to participant electricity bill savings and reviewing program design and governance. Overall, the evaluation found that HPSP was a well-embedded program that was being implemented effectively, that participants were highly satisfied with the program, and that program costs were lower than budgeted (ARTD Consultants, 2012).

However, while the program estimated that it could reduce home energy use by up to 20%, the evaluation indicated average household energy savings of 4% (Rickwood et al., 2012). The results indicated that the majority of the energy savings were achieved primarily through the one-off installation of the Power Savings Kit items made at the time of the home energy assessment, and that further savings from behavior change were not being realized (ARTD Consultants, 2012).

The implications of these findings included a lower than expected cost-benefit result, which was not an ideal policy outcome. A key recommendation of the interim evaluation was therefore that HPSP be adjusted to identify the potential contribution that behavior change can make, and identify methods beyond information provision and small technological and infrastructure enhancements to help participants make sustained behavior changes so that further energy savings could be achieved.

[1] The Power Savings Kit included one stand-by saver power board, four energy efficient light bulbs, one water efficient showerhead, one shower timer, two tap aerators, one set of draught-proof strips for doors or windows, one door seal for the bottom of a door, two door snakes, and one thermometer.