

ATTACHMENT B

**2014 INSTITUTE FOR SUSTAINABLE
FUTURES SMART GREEN APARTMENTS
EVALUATION REPORT**



INSTITUTE FOR SUSTAINABLE FUTURES

SMART GREEN APARTMENTS: PROGRAM EVALUATION REPORT



2014

ABOUT THE AUTHORS

The Institute for Sustainable Futures (ISF) was established by the University of Technology, Sydney in 1996 to work with industry, government and the community to develop sustainable futures through research and consultancy. Our mission is to create change toward sustainable futures that protect and enhance the environment, human well-being and social equity. We seek to adopt an interdisciplinary approach to our work and engage our partner organisations in a collaborative process that emphasises strategic decision-making.

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LIST OF ACRONYMS

ESCs	Energy Saving Certificates
HVAC	Heating, ventilation and air conditioning
ISF	Institute for Sustainable Futures
kL	Kilo Litres
kWh	Kilowatt hours
MJ	Megajoules
PV	Photovoltaic
SGA	Smart Green Apartments
UTS	University of Technology Sydney



EXECUTIVE SUMMARY

This report describes the findings of an evaluation of the City of Sydney's *Smart Green Apartments Program* and provides recommendations to inform the City's future direction in this area.

PROJECT SCOPE

The *Smart Green Apartments* program aims to create more resource efficient, cost effective apartment buildings, focusing on energy and water efficiency, and waste reduction. Under the program, participating buildings received environmental audits, and their Owners Corporations were provided with a *Smart Green Apartments Action Plan* containing tailored recommendations for improving building performance.

The Institute for Sustainable Futures at UTS was engaged by the City of Sydney to evaluate the following key aspects of the program:

1. Costs and benefits of projects implemented, taking into account financial costs and savings, resource savings (energy, water, waste) and greenhouse gas emission reductions
2. Participant experiences of and reflections on the program and feedback on its strengths and weaknesses.

EVALUATION METHODOLOGY

Three research methods were used to assess the savings achieved by the program and understand the experiences of program participants:

- **A savings verification/estimation process** involving interviews with contacts at each building, and a review of the auditor's projections from the action plans.
- **An online survey** distributed to apartment owners, building managers and strata managers.
- **Semi-structured interviews** with program participants.

EVALUATION FINDINGS

Projects implemented

Of all the projects recommended, 30% have been completed and a further 10% are currently in progress. This amounts to 69 projects completed across the 21 buildings surveyed, and a further 24 projects currently in progress.

Project costs

The program has been a catalyst for just over \$1.92 million of investment in resource efficiency projects across the participating apartments.

The total amount spent on completed projects is \$1,219,726, with a further \$705,224 being spent on projects currently in progress. Lighting projects account for the highest proportion of total spending (63%).



Savings achieved by projects

Projects implemented under the program resulted in the following estimated total savings:

- Annual energy consumption savings of 2,655MWh for completed projects, and 569MWh savings for projects in progress
- Energy consumption savings of 33,612MWh over the lifespan of the technologies installed or being installed.
- Annual operational cost savings of \$397,845 for completed projects and \$103,918 savings for projects in progress. Total estimated savings per building ranged from \$610 to \$88,460.
- Annual greenhouse gas savings of approximately 2,627 tonnes-CO₂e for completed projects, and 564 tonnes-CO₂e for projects in progress
- Greenhouse gas savings of 33,276 tonnes-CO₂e over the lifespan of the technologies installed or being installed.
- Annual water savings of 11ML for completed projects, and 24ML for projects in progress.

Monitoring savings

Monitoring is an important aspect of program design as it allows participants and program managers to track whether or not objectives are being met and which actions are most effective.

Many survey respondents reported that savings were being monitored using several metrics (e.g. kilowatt hours, kilolitres). However the researchers had difficulty verifying these savings, with interviews revealing that rigorous monitoring was not being undertaken in any of the buildings. Savings were only being monitored using crude means such as comparing monthly bills, without accounting for seasonal variations or other factors that may have influenced consumption over time. The absence of rigorous monitoring makes the actual impact of individual projects almost impossible to determine. In addition, most buildings were not keeping a record of when projects had commenced or been completed, or documenting whether and how projects had deviated from action plan recommendations.

Experiences and perceptions of the program

Overall, there was a high level of satisfaction with the program, with participants finding it particularly valuable in helping to persuade executive committee members to take action in their buildings. Building managers were generally pleased to have an opportunity to improve their knowledge of energy efficiency, and deliver projects the executive committee was positive about. The most common concern was about the time commitment required from volunteers in order to drive the implementation of projects (generally these were building owners from the Executive Committee, or in some cases building managers).

The findings section of this report (Section 3) provides a more detailed analysis of participant experiences throughout the various stages of the program.



Motivations and barriers

Financial factors were the main motivators for participation in the program, with reducing their building's operating costs the key driver for most participants (nominated by 89% of survey respondents). Reducing the building's environmental impact was also a significant motivator for participation (65% of respondents), together with access to the free expert advice provided by the action plan (for 65% of respondents). This advice was seen as a crucial input to executive committee decision-making. Improving the building's value and an opportunity to improve knowledge of energy efficiency and sustainability were secondary motivators.

Almost half (46%) the participants reported that there had been no barriers to their building joining the program. The most commonly experienced barrier was getting building owners on board (22%).

Perceptions of the audit and action plan report

The action plan was seen as valuable because it helped demonstrate clear savings to the building's executive committee. However, participants would have appreciated the opportunity to follow up with auditors, for example, to seek more detail or assistance with decision-making about implementation and to help them to 'sell' the report to executive committee members. Participants thought the audit reports were clear and easy to understand, and appreciated the summary table that helped them identify priority actions. Interviews revealed that many actions implemented deviated from those recommended by the auditors, either because contractors and installers recommended different products or technologies, or because executive committees preferred to replace equipment (e.g. lighting) at the end of its life rather than immediately.

Reasons for implementing recommended actions

For those projects implemented, the most common reason for going ahead was the potential financial benefits. In particular, most participants were motivated to implement actions that had short payback periods (e.g. less than 2 years), and/or that provided significant ongoing cost savings (motivations nominated by 75% and 88% of survey respondents respectively). Low capital cost of improvements (nominated by 29%) was a weaker motivator than short payback periods. Environmental benefits and ease of implementation, while less common, were other motivators for implementing actions.

Reductions in capital cost due to energy savings certificates (ESCs) were also important, with the majority of participating buildings utilising ESCs (83%), and 75% of survey respondents reporting that they influenced their decision to proceed with projects. However, many participants were confused or unsure about the process of calculating and obtaining ESCs.

Looking to the future, when participants were asked what would encourage them to make further environmental improvements to their buildings, they nominated a compelling business case as fundamental (including short payback periods, ongoing savings and financial incentives such as subsidies or loans). Opportunities to network and share knowledge were also important, as well easier methods of measuring and monitoring savings.



Reasons for not implementing recommended actions

Of the total 229 recommended actions, 136 (59%) were not implemented. The most commonly given reason for this was financial. Payback periods of more than 2 years were unattractive to apartment owners, and were the most common reason for not going ahead (58%). The next most common reason given was insufficient ongoing cost savings (33%). Although capital expenditure was a concern, some buildings expended significant capital in instances where the projected savings meant the payback period was short. Other reasons for non-implementation of projects included a perception that they were impractical, insufficient information, or the limited time and capacity of the volunteers involved.

The sheer number of Action Plan recommendations was overwhelming for some executive committees, suggesting that action plans might be more persuasive if they clearly highlighted a small number of top priority actions with priorities determined in advance with buildings.

Few water saving projects were implemented and no waste projects were implemented, according to the participants interviewed.

Enablers and barriers to implementing actions

Many buildings (42%) did not experience any difficulties in implementing their chosen actions, and the vast majority (92%) were satisfied with those actions they had implemented.

When asked about success factors, 71% of participants pointed to the clear recommendations and costs provided in the action plan. Many also identified having an active champion to drive the project as an important ingredient for successful implementation (67%). Access to free expert advice and cooperation by the building manager were other factors identified as important influences on project success.

The most commonly mentioned barriers to implementation were the challenge of finding the right contractors or products (25%), and the lack of an active champion to drive the implementation process (12.5%).

Engagement, capacity building and behaviour change

The evaluation made a number of additional findings in relation to program communications, the engagement of participants, and the capacity building potential of the program.

Generally, participants indicated that communication throughout the program was adequate, however they identified a number of ways it could be improved. Participants particularly enjoyed the opportunity to communicate and share information with people from other buildings, however they would have appreciated further follow up from these meetings and other opportunities to communicate, such as an online forum. For buildings with a significant number of residents from non-English speaking backgrounds, highly visual summary information, and information in other languages, would be useful. Participants also suggested they would have benefited from a summary of government incentives, rebates and programs related to energy efficiency and renewable energy.



The importance of program ‘champions’ was a strong theme in the evaluation. In each building, participation in the program tended to be driven by one or two motivated and active apartment owners. While they tended not to oppose participation, the majority of other owners in the building were typically quite disengaged, lending little support to champions. Program champions were most commonly executive committee members, although some were building managers. These champions contributed to the success of the program in a variety of ways, ranging from taking initiative to contributing technical understanding.

Participants did not believe that participating in the program had contributed to building a sense of community within their building, but they did find the opportunity to connect with champions from other buildings and share knowledge to be highly valuable.

The vast majority of program participants surveyed (92%) thought that the program had built their knowledge and capacity with respect to resource efficiency in apartment buildings. Furthermore, many were putting what they had learned to practical use. Almost all (96%) survey respondents said they intended to implement further improvements, and 46% were actually in the process of planning further actions.

These results suggest that the program had a very positive capacity building effect. Participants said the program had given them new ideas and knowledge about energy efficiency opportunities in apartment buildings, and the confidence to implement them.

While capacity building outcomes were very positive, the interviews indicated participants could have further benefited from targeted information on energy literacy, rebates, incentives, and interpreting bills.

Although several buildings are still in the implementation stage of their participation in the program, others are now looking to future opportunities. Some are pursuing options for further savings, such as focusing on energy use within individual apartments. Others are investigating group purchasing of electricity. Over a quarter (29%) of participants reported that their buildings had joined the *Smart Blocks* program, with a further 38% unsure. Those who had not yet joined indicated that further information and networking opportunities would provide a good incentive. Assistance with specific projects such as PV (photovoltaic) system installation was also mentioned as likely to be a motivator.



SUMMARY OF RECOMMENDATIONS

Program design and planning	1. Establish a project plan, using a framework such as program logic, to guide program implementation and evaluation
	2. Establish a clear plan and set of procedures for data collection. Data collected should include: <ol style="list-style-type: none"> a. baseline resource consumption data b. project implementation details c. financial and resource savings (kWh, GJ and kL)
	3. Consider providing incentives linked to the delivery of data
	4. Explore the option of accessing billing data from utilities to reduce the data collection load on program participants
	5. Establish a communications and engagement plan
	6. Explore ways to incentivise and communicate the benefits of water and waste projects to increase implementation rates
	7. Consider involving key stakeholders such as SCA and Green Strata in co-design of the next iteration of the program
Recruitment	8. Consider using past project 'champions' to assist in promoting the program in communications material and at events
	9. Tap into trusted networks to promote the program, such as local community and environment groups, local schools and relevant stakeholder organisations
	10. Focus on identifying an active 'champion' for each building in the recruitment phase and providing them with ongoing support
	11. Ensure sufficient information is provided at recruitment stage about the program and what is required of participants
	12. Ensure participants understand and commit to data collection requirements upon sign-up
	13. Provide sufficient tools, resources and support to make data collection easy (e.g. simple template, guidelines, training)
	14. Establish a welcome event to launch the program, with networking opportunities and presentations by past 'champions'
Implementation	15. Expand information and training resources to cover: <ol style="list-style-type: none"> a. energy literacy, including interpreting bills b. basic data collection skills c. financial incentives/ understanding ESCs
	16. Ensure information is layered and tailored to audience groups, provide information in a range of formats to suit different needs, and consider translation of key documents into other languages



	17. Continue to provide face to face networking opportunities for program participants
	18. Consider extending networking capability via an online forum
	19. Look for opportunities to build a 'community of practice' around sustainable, resource-efficient apartment buildings
	20. Consider incorporating basic capacity-building opportunities into networking events, to build base-level knowledge and skills in the topics identified in recommendation 15
	21. Offer further learning and capacity-building opportunities for those interested, by providing short interactive training sessions on relevant topics as identified in recommendation 15. Consider incorporating content into existing training programs such as Strata 101.
	22. Simplify and prioritise action plan recommendations: <ol style="list-style-type: none"> a. Prioritise 'quick wins' with short paybacks b. Identify which actions are best considered when equipment is due to be replaced rather than immediately c. Check recommendations for compliance and practicality
	23. Allocate resources for auditors to help 'sell' and explain action plan recommendations to executive committees
	24. Provide project champions with access to technical support during project implementation. Ensure this is well advertised so participants know support is available and how to access it.
	25. Consider providing project management support to champions during project implementation (e.g. help with organising quotes and installations) to relieve some of the time burden
	26. Recognise good performance by champions and their buildings via awards or certificates
	27. Collect feedback from participants and use it to inform ongoing improvements to program implementation and management
Monitoring and evaluation	28. Ensure the data collection plan and procedures developed as part of the project plan are properly implemented
	29. Establish an online platform for tracking resource use and benchmarking performance against similar buildings
	30. Advocate for data improvements within the apartments sector to enable accurate benchmarking and comparison



1 BACKGROUND AND CONTEXT

This report describes the findings of an evaluation of the City of Sydney's Smart Green Apartment program and provides recommendations to inform the City's future direction in this area.

This section provides background, and context, describing why the issue of sustainability in apartment buildings is significant. Section 2 describes the SGA program itself, and specifies the scope of this evaluation. It also briefly outlines the relevant considerations for an evaluation of behaviour change programs such as this. Section 3 describes the specific evaluation methodology used in this project. Section 4 presents the findings and Section 5 provides recommendations.

1.1 SUSTAINABILITY IN APARTMENT BUILDINGS

Increasing numbers of Australians are living in apartments¹. This trend is particularly evident in inner Sydney. In the City of Sydney Local Government Area, 70.2% of dwellings are now apartments of 3 storeys or more, while 24.5% are medium density (semi-detached houses, terraces, townhouses and apartments of up to 2 storeys) (Community Atlas, 2011).

The growing shift towards apartment living has implications for resource use, particularly energy. While low rise and mid-rise apartments generally consume less energy (per dwelling share) than a detached home, high rise apartments typically use substantially more, with much of this attributed to common areas. This indicates that the *Smart Green Apartments* (SGA) program is well targeted, if the objective is to reduce energy use and greenhouse gas emissions in City of Sydney dwellings.

A 2005 study by the NSW Department of Planning and Energy Australia found that a typical high rise apartment uses around 30% more energy than a typical detached home, with over 40% of total energy usage attributed to common areas. An evaluation of Willoughby Council's *Climate Clever Apartments* program in 2010 found that high rise apartments generated four times the greenhouse gas emissions of villas and townhouses, and three times the emissions of low and medium rise apartments (KMH Environmental, 2010).

There is therefore great potential to improve the environmental performance of apartment buildings by focusing on common area upgrades. Opportunities to save water in apartment buildings are also significant, however, unlike energy, the vast majority of total building water consumption is water used inside individual apartments. As the Green Strata website reports: "while it is often assumed that pools, spas and retail tenants are to blame for large water bills, studies using sub-

¹ Nationally, the number of dwelling units approved in apartment buildings increased by 26% in 2010-11, with a substantial increase of 70% for apartment buildings with four or more storeys. Apartment living is most common in capital cities, particularly in Sydney (Year Book Australia, 2012, Australian Bureau of Statistics).



metering show this is rarely the case. It is common for 90% or more of water use in an apartment building to be used inside the apartments”. However the absence of water metering for individual apartments in many apartment buildings provides a disincentive for apartment owners to implement water saving strategies in isolation. Green Strata recommends therefore that owners’ corporations need to approach water consumption on a building-wide basis.



2 SGA PROGRAM AND EVALUATION SCOPE

2.1 SMART GREEN APARTMENTS PROGRAM

As suggested at Section 1.1, the apartment sector is one that can contribute significantly to the City of Sydney's broader goals for 2030, in particular the reduction of energy use and greenhouse gas emissions.

In response to this opportunity, the City of Sydney's *Smart Green Apartments* program seeks to create more efficient, cost effective apartment buildings, focusing on energy and water efficiency and waste reduction. The program also recognises that the apartment building sector has its own complexities that can make resource efficiency a challenge. In response, it provides relevant kinds of support and incentives tailored to the unique context of apartment buildings, focusing on the resource-saving potential of common area upgrades and the need to encourage and enable better decision-making by owners' corporations in this respect. In this way, the design of the program is intended to improve building performance, minimise environmental impacts and increase social connectedness in relation to greening initiatives.

Implementation of the SGA program

An initial pilot was developed and implemented with 5 apartment buildings, and subsequently a further 25 buildings were added to the program. As a result, a total of 30 apartment buildings in the City of Sydney Local Government Area (LGA) received comprehensive energy audits from the Office of Environment and Heritage's Energy Saver program, with costed recommendations and clearly specified payback periods. All buildings also received a waste and recycling assessment. In addition, the 5 pilot buildings received base building water management plans, and 14 of the highest-water-consuming buildings were selected for water-efficiency assessments focused on savings potential within individual apartments. Following these various audits, each building's Owners' Corporation and management committee was presented with a consolidated *Smart Green Apartments* Action Plan containing recommendations to improve building performance.

2.2 SCOPE OF THIS EVALUATION

The Institute for Sustainable Futures was engaged by the City of Sydney to evaluate the outcomes of the *Smart Green Apartments* program, across the 30 participating apartment buildings. The evaluation focused on two key aspects:

1. Costs and benefits of projects implemented, taking into account financial costs and savings, resource savings (energy, water, waste) and greenhouse gas emission reductions.
2. Participant experiences of and reflections on the program, including:
 - Motivations for joining the program
 - Motivations for implementing particular actions



- Barriers to implementing particular actions
- Engagement, capacity building and behaviour change outcomes
- General strengths and weaknesses of the program.

The Institute did not undertake a full program evaluation, and the scope of the work did not include, for example, cost-effectiveness estimates at the program level, consideration of rebound effects or assessment of whether behaviour changes were sustained over time.

2.3 EVALUATING BEHAVIOUR CHANGE PROGRAMS: LESSONS FROM LITERATURE

Whilst a full program evaluation was beyond the scope of this project, recommendations have been developed with reference to the key factors that make behaviour change programs successful. This is important because changing behaviour, and sustaining that change, is a crucial focus of the SGA program. While the program may focus resources on a relatively small number of buildings, it has the potential to be a catalyst for continuing change, not only within the buildings involved, but for the apartment building sector more broadly.

Leading evaluation frameworks for behaviour change programs are briefly described below. The recommendations developed as a result of this evaluation have been structured to align with a program logic framework, simply to support their easy integration into the design of any future programs in this area.

2.3.1 SUCCESSFUL BEHAVIOUR CHANGE PROGRAMS

In addition to impacting on key sustainability indicators such as energy use or numbers of participants during the life of the program, many behaviour change programs aim to build the motivation, skills and capacity of participants to make changes that are sustained over time, and that contribute to a longer-term vision or outcome.

A key characteristic of behaviour change programs is that they consider systemic enablers and barriers to change. They seek to address the range of physical, social and individual constraints on behaviour, and build the kinds of capacities necessary to achieve the desired outcome.

While undertaking an evaluation of food-waste recycling services in apartment buildings for Leichhardt City Council (Herriman, et al. 2014), ISF found that limited academic research on sustainability in apartment buildings exists. Apartment buildings have a unique set of characteristics that influence how resources are used and managed together with a regulatory and policy environment that guide how buildings are constructed and operated. Apartment buildings also vary significantly in physical infrastructure and composition of residents as well as decision-making bodies.

The following issues were identified as specific to apartment buildings and understanding behaviour change for sustainability programs:

- Transient population: Particular apartment buildings often experience high turnover in residents, particularly where there is a high level of leased units



or holiday rentals. This means that information and education initiatives need to be repeated frequently to be certain of good coverage amongst residents.

- Communication flows: Strata/building managers (and for renters, real estate agents/landlords) can act as gate-keepers.
- Anonymity and shared responsibility: The anonymity of users in apartments and a sense of 'shared responsibility' for common property allows residents to take the easy way out.
- Disempowerment and disinterest: Apartment buildings often have high levels of renting tenants who are not represented on the executive committee or engaged in decision-making, and who may be on short-term leases. This can result in apathy.

A number of solutions/recommendations were generated in response to these issues:

- Identifying and/or creating building 'champions': Identify interested/engaged building managers and tenants to become champions, particularly in buildings where residents identify as a building community.
- Ensuring that decisions are made at executive committee meetings, so that they are minuted. Remind landlords/real estate agents of responsibility of passing information onto tenants.
- Concentration of people in one building provides opportunity for well-designed and well-placed educational/motivating signage in high traffic areas.

A recent review (Riedy et al, 2012) of behaviour change programs provides valuable guidance on best practice in sustainability engagement. This review considered behaviour change at the household level and identified ten important principles to guide development of programs. We suggest that the principles remain relevant to apartment buildings and behaviour change programs more generally and are valuable to consider for future iterations of engaging apartment owners, executives, managers and residents in the City of Sydney.

1. Household sustainability engagement programs need to look beyond the individual to the systems and groups they are embedded in if they are to be effective in transitioning to more sustainable practices.
2. Engagement programs should take advantage of 'moments of change' as a way to unfreeze habits and establish new, more desirable behaviours.
3. Other people's behaviour matters:
 - a. Recruit influential messengers for the desired audience and have them demonstrate desirable practices
 - b. Involve government, business and the community so that households perceive a fair basis for action
 - c. Form participants into supportive teams (face-to-face or online) or tap into established groups
 - d. Employ injunctive and descriptive norms and seek long-term shifts in these norms
 - e. Make inconspicuous practices visible.



4. Use market research to understand and segment your audience and identify their current practices.
5. Identify the target behaviours that are the end goal of the engagement and design and test messages and strategies to support those behaviours.
6. Start where people are and connect to their existing, local concerns through participatory processes and support for existing community groups and leaders.
7. Design messages and programs to nurture intrinsic values and challenge extrinsic values
8. Use framing to design messages that are positive, inspiring and appeal to existing mental models.
9. Pilot and evaluate multiple engagement programs before final deployment.
10. Make it easy for householders to access, participate and implement program activities

Incorporating the above principles into the design of sustainability behaviour change programs can contribute to the longer-term aims of such programs. Considering these issues in program design can help facilitate awareness raising, skill development and capacity building, and thereby develop a pool of 'champions' in the field, establishing a strong foundation for ownership of future actions and direction.

Appendix A contains more detail on principles to guide the design of good behaviour change programs.

2.3.2 BEST PRACTICE EVALUATION FRAMEWORKS

Behaviour change programs are inherently complex and their 'voluntary' nature means that monitoring and evaluation are paramount in order to gauge their success or failure, capture lessons learned in order to improve current and future programs, and determine the return on investment in such projects.²

There are a number of program design and evaluation frameworks available to program managers. The Better Evaluation website provides many tools to guide various elements of evaluation.³

Program Logic is commonly used to guide both program design and subsequent evaluation, learning and change. Primarily a qualitative framework, it can help to guide a project plan and to inform measurement of the effectiveness of behaviour change programs. Program Logic is recognised as a core program design process for program managers and designers in the NSW Department of Premier and Cabinet Evaluation Toolkit.⁴

² Source: www.evaluationtoolbox.net.au

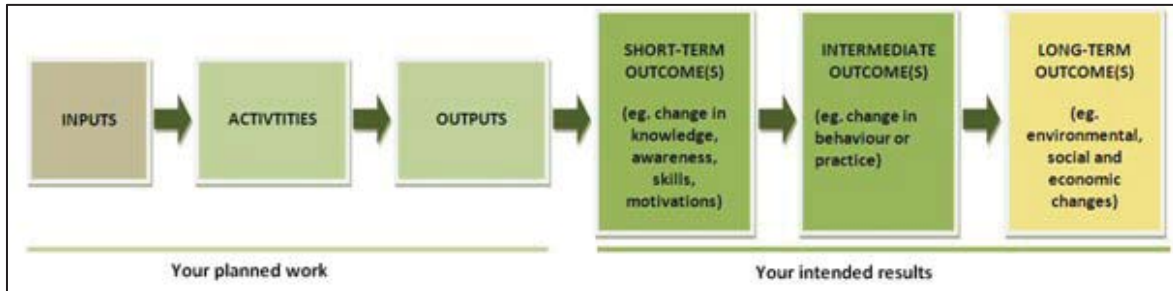
³ See: http://betterevaluation.org/resource/tool/be_planning_tool

⁴ See: http://www.dpc.nsw.gov.au/programs_and_services/policy_makers_toolkit/evaluation_toolkit



Figure 1 shows how the Program Logic framework guides all stages of the program. It is worth noting that although this framework is represented in a linear form, good behaviour change programs often include iterative cycles that allow for lessons learned throughout the process to be captured, and for the program to be modified accordingly, even as it is delivered.

Figure 1. Program Logic Framework Guide



Source: evaluationtoolbox.net.au

Without such a framework in place, evaluations can be limited in their ability to clearly attribute causal links and assess the efficiency, efficacy and effectiveness of a program.



3 EVALUATION METHODOLOGY

This research project employed a range of qualitative and quantitative research methods to verify the savings achieved by the program and to document the experiences of program participants. This section describes these three research methods in more detail.

3.1 SAVINGS VERIFICATION/ESTIMATION

The aim of this process was to gather data on the status of projects implemented and the savings achieved in practice. The process involved several steps as described below. Due to unforeseen data constraints the calculation method (step 3) was adjusted:

1. **Review of existing data:** Researchers reviewed existing data provided by the City of Sydney, including a summary of action plans for each building. This was intended to inform a cross-check of data with program participants.
2. **Data collection and cross-check:** One contact person from each participating building was asked to provide data on actual savings and outcomes against identified projects. However, researchers discovered that participating buildings had not collected data on savings to the level of detail expected. This meant it was not possible to cross-check savings data with the action plans as originally intended. The research team was therefore required to adjust the approach and use a process of estimation (see below).
3. **Calculation (estimation) of savings:** Collected data was collated and analysed in order to determine the number of projects that have been completed, are still in progress or had been abandoned. It was originally anticipated that participants from each building would also provide quantitative data on savings achieved from implementing each action and that this would be used to calculate savings per action (\$, kWh and kL). However an absence of such data prevented the research team from verifying savings. Instead, using information regarding the status of projects and the ways in which actions undertaken matched or deviated from the recommended actions, researchers used the auditor's projection of savings to estimate the savings achieved from projects implemented to date.

3.2 ONLINE SURVEY

Survey design

An online survey was used to explore a range of questions relating to program participation, implementation and savings. The survey was distributed electronically to 90 people from the 30 participating buildings (i.e. to several contacts from each building).

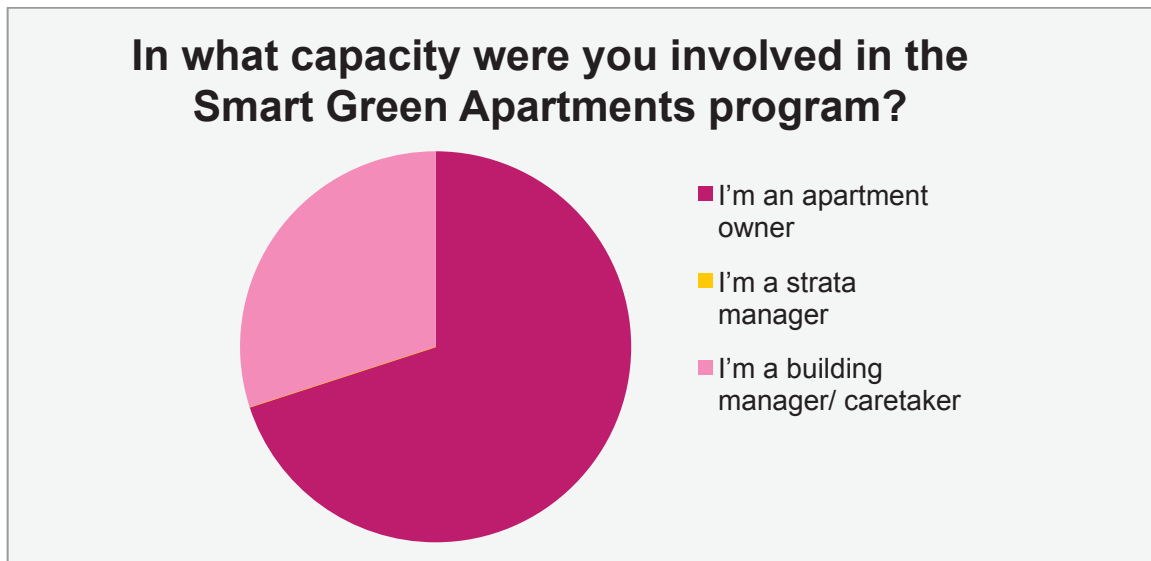


Questions were tailored to the three key groups of apartment owners, building managers, and strata managers, to reflect each group's different responsibilities and levels of involvement in the program.

Survey response

A total of 30 program participants responded to the online survey (a response rate of 33%). Respondents were drawn from 23 of the 30 participating buildings. As shown in Figure 2, 21 of the 30 respondents (70%) were apartment owners, while the remaining nine were building managers. No strata managers responded to the survey.

Figure 2: Profile of survey respondents



Of the apartment owners, it appeared all were owner/occupiers (rather than investors), and all were members of the strata executive committee.

Survey analysis

The analysis of the survey data identified key motivations and barriers to participating in the program and implementing projects, and explored the experiences, successes and challenges faced by 'champions' from each building (those driving the implementation of projects). It sought to identify the strengths, benefits and positive social outcomes of the program, and any weaknesses, or challenges faced.

3.3 INTERVIEWS

Interview design

Semi-structured interviews with a cross-section of program participants were used to provide greater insights into themes emerging from the survey, exploring and testing these findings in further detail. The interviews were also designed to explore issues that were not thoroughly addressed in the savings verification process or the survey, as well as to provide participants with an opportunity to offer their own insights and suggestions.



Interviewees

Telephone interviews were conducted with contacts identified by the City of Sydney as having played a significant role in the implementation of projects in their buildings. Representatives from 21 buildings were interviewed. Contacts at the other 9 buildings either declined to be interviewed or were unavailable for the duration of the research. Of the 21 interviewees, 17 were apartment owners, all of whom were also representatives of the executive committee for their building, three were building managers and one was a strata manager.

Interview analysis

The interview data was analysed with a view to extracting insights relevant to the two key themes of the evaluation. The analysis sought in particular to develop a deeper understanding of participants' experiences of and views about the program.



4 EVALUATION FINDINGS

This section draws together and provides an analysis of the data collected in the three research tasks described in Section 3. The findings of the evaluation are presented according to key themes, with extracts from the survey and interview data used to illustrate these themes.

4.1 GENERAL IMPRESSIONS OF THE PROGRAM

Key findings

- There was a high level of participant satisfaction with the program
- The burden on volunteer time was noted as a key concern

Overall, comments indicated generally high levels of satisfaction with the program. Interviewees generally gave positive comments, and saw value in participating in the program.

'It was extremely well thought out.'

'Overall, it was a well-run program.'

'I thought it was very comprehensive.'

Interviewees noted that the program was seen as particularly valuable due to the assistance it gave them in persuading executive committee members to take action.

'The best thing as far as I was concerned was that it gave strength to the argument we should do something and look at some things. Without the City Council's input it would have been hard to win over some of the other committee members who say, "Why should we bother?" The program was very helpful in actually getting people to agree to let us do it.'

Building managers were also generally pleased about the program as it helped them to deliver projects that the executive committee are positive about, and helped to build their knowledge of energy efficiency.

'These programs help make the building manager look good as it allows them to deliver savings.'

The 'champions' driving projects were usually volunteers from the executive committee, and sometimes building managers who were driving projects on top of their regular responsibilities. A keen concern relating to the program related to the burden upon volunteer time and capacity that is required to implement such a program. However, there was no consensus among interviewees about how to limit the burden upon volunteers, with some suggesting that a longer project period would be more manageable, while others argued that a shorter timeframe would reduce the burden placed on volunteers.

'You need continuity over several years and then you will be able to get more done. If the whole thing is continued, we will implement more.'



‘Long, drawn out programs lose volunteers – [we] can’t keep people committed over long periods of time. Need to start and implement in a quicker time frame, otherwise volunteers drift in and out.’

4.2 JOINING THE PROGRAM

Key findings

- Financial factors were the key reasons buildings chose to participate in the program
- The free audit report was a key motivator for joining the program.

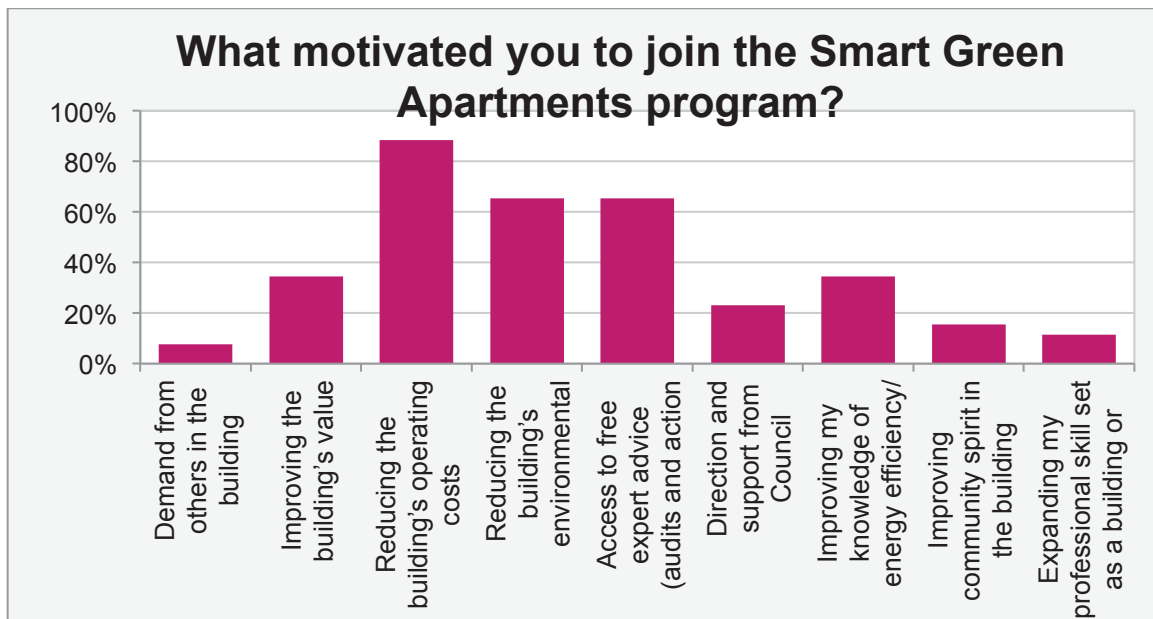
Survey respondents were asked to identify key motivations for joining the program, and were asked to select all options that applied to their experience from a list of options. As shown in Figure 4, the most common motivator was financial – ‘reducing the building’s operating costs’, with 89% of respondents selecting that option, and with 35% of respondents selecting ‘improving the building’s value’ as a motivator.

65% of respondents identified that ‘access to free expert advice’ was a key motivation for joining the program, suggesting that access to free audits and action plans was an important motivating feature of the program.

Environmental consciousness appeared to be relatively high among respondents, with 65% of respondents selecting ‘reducing the building’s environmental impact’ and 35% of respondents selecting ‘improving my knowledge of energy efficiency/sustainability’.

A third of building managers who responded to the survey indicated that a key motivator was ‘expanding my professional skill set’.

Figure 3: Reported motivation for joining the SGA program



Interviewees confirmed the survey findings, indicating that the opportunity to save money was a key motivator for joining the program, as was the opportunity to have a building audit conducted for free. Additionally, some interviewees noted that concern for the environment had influenced their committee's decision to participate in the program:

'There are a number of us on the committee that are also fairly green minded in general in our own personal lives ... So also there would have been some personal motivation from some of the members on the committee to personally be more green and ensure that our building looked more green.'

'[There was] a realisation among myself and other committee members that technology changes have brought the price curve down such that it is now worthwhile looking at alternative technologies for reducing energy consumption.'

'I think – to be honest – that cost saving is the driving thing and then people feel good about not damaging the planet as a secondary thing.'

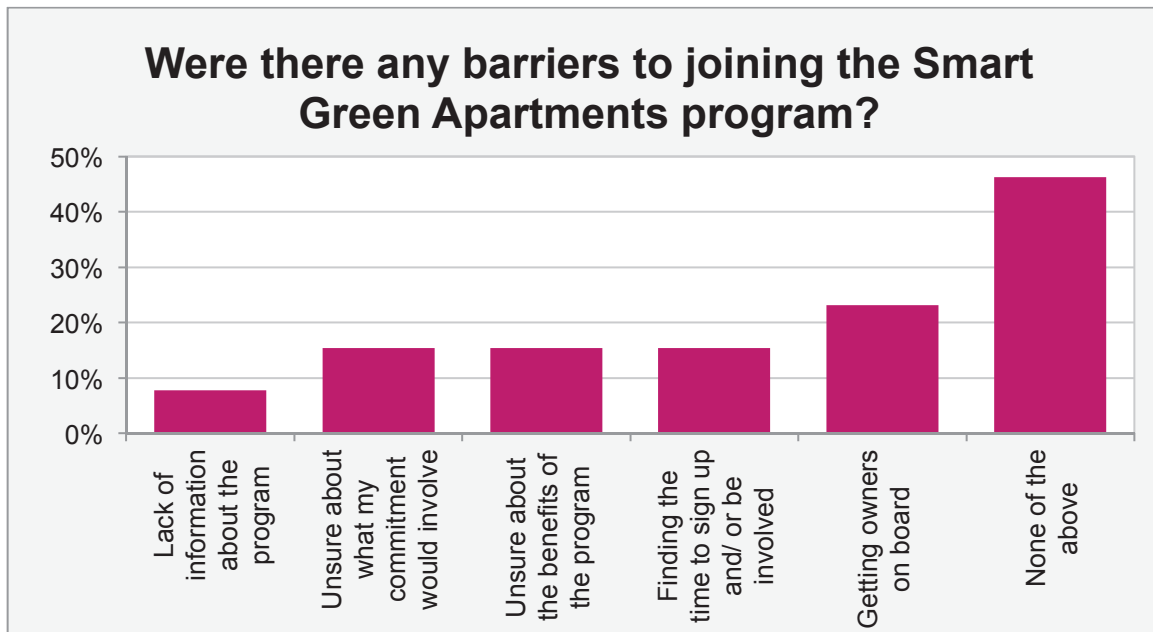
Respondents were also asked to identify barriers that they faced when joining the program. As Figure 4 shows, 46% of the respondents indicated that they did not experience any of the barriers listed when joining the program. Several interviewees noted that, although they may have experienced difficulties in implementing actions, there were no difficulties in convincing the building to join:

'We had absolutely zero objectors to participating in the scheme.'

The most commonly experienced barrier was 'getting owners on board'. Other common barriers include 'finding time to sign up and/or be involved', 'unsure about the benefits of the program' and 'unsure about what my commitment would involve'. These final two responses may indicate that the program would have benefited from clearer communication about the benefits and requirements associated with involvement in the program.



Figure 4: Reported barriers to joining the Smart Green Apartments program



4.3 CHOOSING RECOMMENDATIONS TO IMPLEMENT

As part of the program, each building received an audit report with an action plan outlining the projects recommended by the audit. This report was intended as a key decision making tool, to guide decision making by executive committees.

4.3.1 AUDIT REPORT

Key findings

- The action plan was valuable to participants as it helped demonstrate potential savings to executive committees
- Participants indicated they would have appreciated the opportunity to follow up with auditors to ask further questions about actions and technologies. This would have assisted decision making and provided clarity on complex projects.

The audit report was considered by interviewees to be a key benefit of participating in the program. Interviewees felt that the audit report was valuable in that it helped to demonstrate potential savings to members of the committee.

‘The action plan helped to demonstrate a reasonable payback.’

‘[The action plan] gave strength to the argument to implement actions – [it] helped get people on board.’

Participants liked that the audit reports were generally very clear and easy to understand. They appreciated the summary table that helped them to identify priority actions.

‘Reading through the report is quite clear. The summary table is very useful.’



'What I liked about the program was the fact that if you didn't have any understanding or a knowledge of anything to do with energy savings, there was information provided for the most simplest thing. Very simple, common sense information was provided.'

The management summary extract of [the report] did help a lot in illustrating to decision-makers such as committee members some of the areas that we should spend some time and money on.'

Participants indicated general satisfaction with the consultants who conducted the audits of each building.

'The consultants did a good job and offered a common sense approach. They focused on getting results for the buildings.'

However, participants were concerned that they were unable to 'sell' the report to members of the committee, and several noted that they would have appreciated further involvement of the consultant. Several respondents requested that the consultant attend an executive committee meeting or AGM to help explain the actions, while others would have like to have been offered the opportunity to follow up on several matters with consultants.

'It's all very well writing reports, but they often need to be sold ... We actually had to invite the engineer who prepared the initial report to explain in layman's language how some of these recommendations would work. In order for us to get the executive committee to get to vote on [spending] the money, we invited the engineer to come and meet us one evening to run through some of the recommendations in the report.'

'The technical consultants that [the City of Sydney] paid for came out and were good, except when we had some technical questions they weren't so easy to get hold of again.'

Interviews also revealed that many of the implemented actions deviated from what was recommended in the action plan. Actions deviated from the action plan in several ways:

- Different technology was recommended by contractors and installers to that recommended by auditors;
- Executive committees often preferred to replace equipment at the end-of-life rather than immediately, thus many projects such as lighting upgrades will be implemented incrementally
- Some buildings found that it was only practical to replace a portion of the fittings that were recommended for replacement. For example, the action plan may have recommended an upgrade of car park lighting, but it turned out to be impractical to implement upgrades in individually-secured parking spaces, and thus only some of the car park lighting was replaced.



4.3.2 REASONS FOR DECIDING TO IMPLEMENT ACTIONS

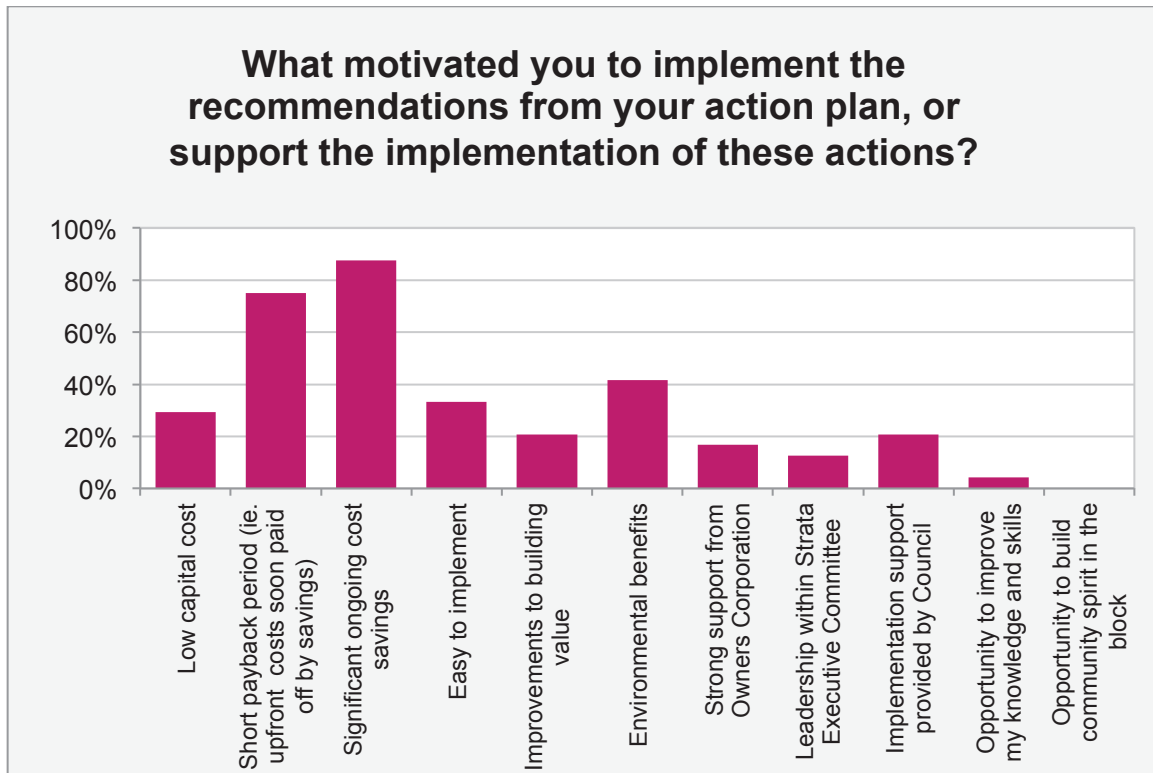
Key findings

- Short payback periods (under two years), ongoing cost savings and environmental benefits were selected as key reasons for the selection of actions for implementation
- Upfront capital cost was less significant than having a short payback period in determining which actions were implemented.

Financial motivators were the key reasons that respondents identified for implementing actions – ‘short payback periods’ (75% of respondents) and ‘significant ongoing cost savings’ (88% of respondents) were most commonly identified as shown in Figure 5, and with 29% of respondents selecting ‘low capital cost’. This suggests that financial considerations were of greatest priority in decision-making processes.

‘Environmental benefits’ were also identified as being a relatively common motivator, with 42% of respondents selecting that option, and ease of implementation featured highly also.

Figure 5: Motivations for implementing actions recommended in the action plan



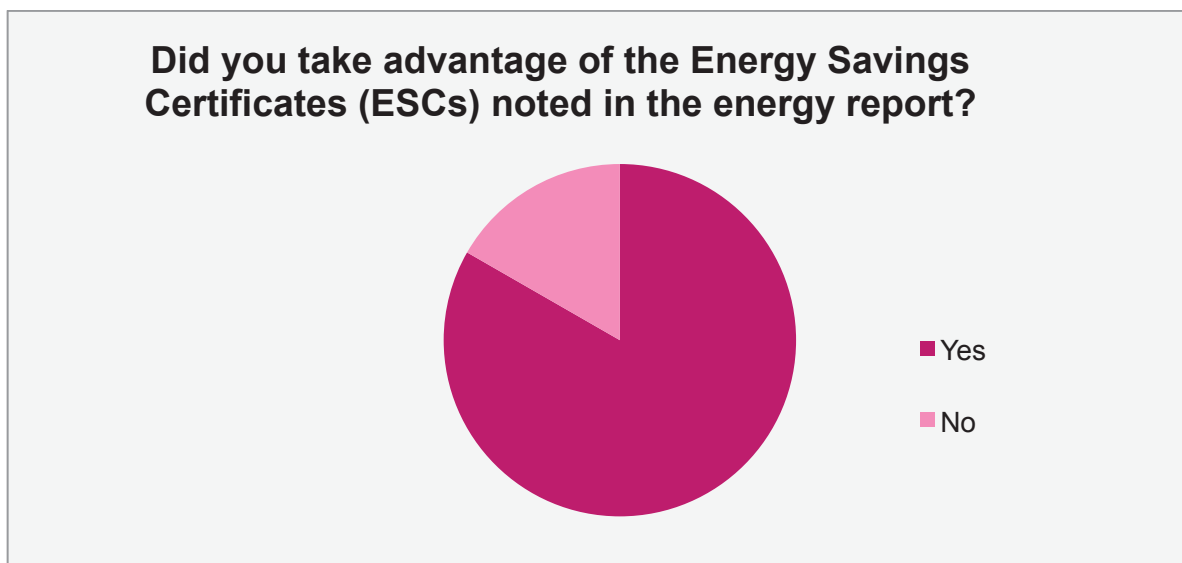
4.3.3 ENERGY SAVINGS CERTIFICATES AS A MOTIVATOR

Key findings

- The majority of participating buildings used ESCs
- Participants were confused about exactly what ESCs are and how they work, and more information is required to ensure that participants have a clear understanding of ESCs.

The majority of respondents (83%) indicated that they utilised Energy Savings Certificates (ESCs) to implement their actions, as shown in Figure 6. Significantly, 75% of respondents indicated that ESCs influenced their decision to proceed.

Figure 6: Number of buildings using ESCs



All of those respondents who obtained ESCs indicated that they believed that they used an accredited certificate provider to obtain these. However, it is unclear whether respondents understand how to discern whether their certificates came from an accredited certificate provider.

Respondents were largely confused about how ESCs are calculated. Many were left confused and unsure about the process.

'There's a whole sort of black art with how they work out the numbers.'

'The hardest part about it was understanding what an ESC was'

'There was a bit of mystification about the fact that these ESCs appeared to be traded and bought at different prices. Different contractors would be able to give radically different prices ... It was rather confusing.'

These quotes demonstrate the need for further information to be provided to buildings about what ESCs are and how they are calculated, to avoid confusion about exactly how such programs work.



4.3.4 REASONS FOR DECIDING NOT TO IMPLEMENT ACTIONS

Key findings

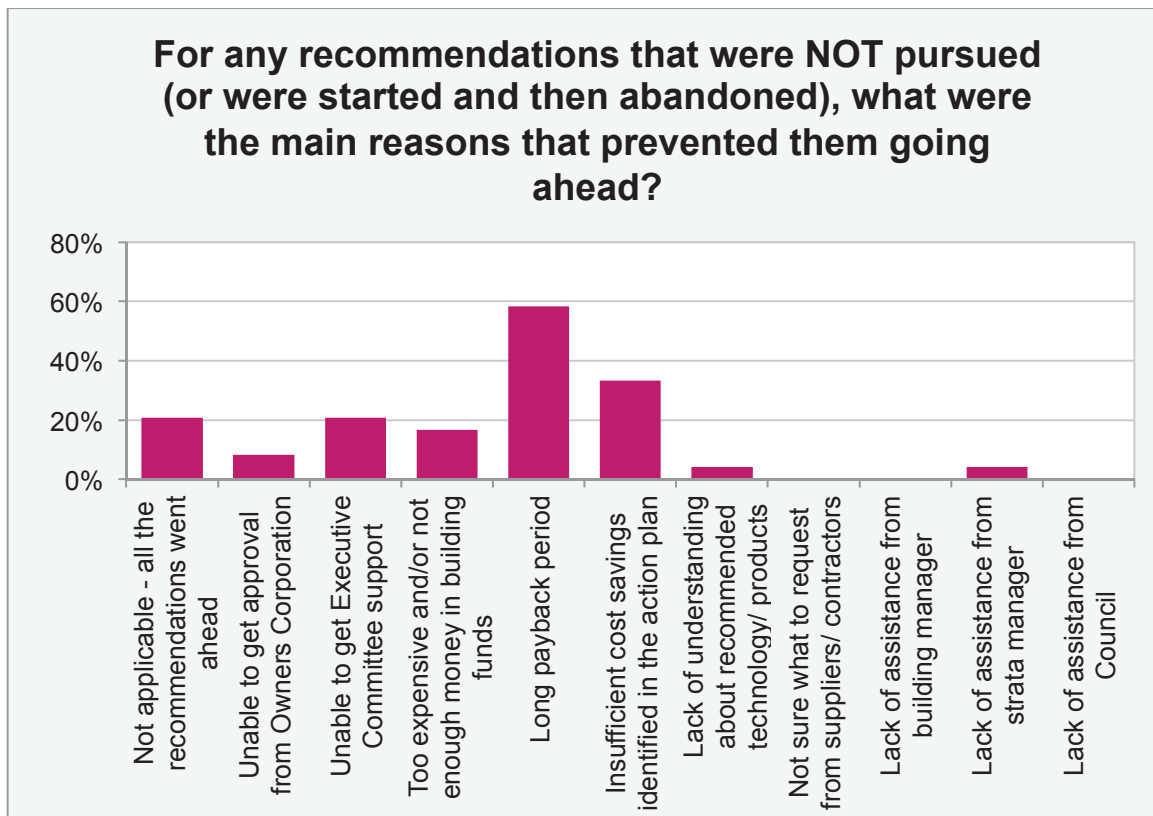
- Payback periods of more than two years tend to be unattractive to apartment owners
- More technical support for volunteer executive committees may be needed to help them implement actions
- Some buildings considered some projects listed in the action plan to be inappropriate, impractical or unfeasible.

Respondents to the survey were asked to identify their reasons for *not* implementing actions that were recommended on their action plan. As shown in Figure 7, the most commonly selected answers once again indicated that financial considerations were of prime significance – ‘long payback periods’ (58% of respondents) and ‘insufficient cost savings’ (33% of respondents) were the most popular responses.

Another key barrier was identified as an inability to gain executive committee support for the action (21% of respondents selected this response) – however the reasons for this lack of support from executive committees are not identified.

Neither lack of assistance from Council nor building managers was identified by any respondents as a barrier to implementation.

Figure 7: Reasons for deciding not to implement recommended projects



Throughout the interviews, participants in the program indicated that the capacity of the volunteer committee was limited, both due to inadequate information and knowledge about energy efficiency, and due to pressures upon their time. Interviewees noted that more support, including follow-up advice and consultation with technical consultants, is needed to ensure that committees have the information they need to proceed.

Providing more support for voluntary committees to make informed decisions [is needed].

Technical consultants were good, but they weren't able to provide follow-up information and advice.

Interviewees suggested that a longer engagement period for the technical consultants was needed to allow time for them to present to committees, to answer questions and to conduct follow up work such as more detailed feasibility work.

Interviewees also noted that the sheer number of projects was overwhelming for committees, and that due to competing priorities and constraints on volunteer time, it was unlikely that they were going to be able to implement all projects listed on the action plan.

'There were a lot of projects, so I think the expectation that we could do of all them was unrealistic, because executive committees are all volunteers.'

Interviewees suggested a few strategies to alleviate this issue in future:

- Identify only a few priority issues in action plans;
- Provide improved technical support for executive committees;
- Utilise a prioritisation criteria in developing the action plan to prioritise actions for implementation in the short, medium and long term; which may provide committees a sense of progressing towards an achievable goal.

Long payback periods were a major reason why projects did not go ahead. Participants consistently mentioned that any project with a payback longer than two years was unlikely to be approved by the owners' corporation or executive committee. Projects such as renewables installations, HVAC replacements and hot water system upgrades were consistently knocked back by executive committees due to long payback periods.

'If the calculated payback is more than two years it's pretty hard to get agreement. Less than two years, it's pretty easy to push it through.'

'Long payback periods are simply not attractive to executive committees.'

However it is worth noting, based on the implementation data collected by this project, that many projects with paybacks of longer than 2 years were still implemented.

Upfront capital costs were also mentioned as a reason why executive committees did not endorse projects. However, several buildings expended significant capital funds to implement projects in instances where the payback period was short. Thus, it appears that although capital expenditure is something of a concern, it is not as crucial a priority for executive committees as the payback period.



‘Spending money up front is met with reluctance – everyone was concerned about payback times.’

‘The larger [projects], such as gas and the solar PV ... there's large capital involved in them – you have to approach all of the [owners] to get approval from the majority of the owners. That's the difficulty with implementing the larger schemes.’

Factors that complicated decision-making such as a lack of information, constraints upon volunteer time and competing priorities were also commonly mentioned as reasons why actions were not implemented. Executive committees were often responsible for leading the initiatives, and as volunteers driving such activities in their own time, they found it difficult to set aside time to contribute to the implementation. Other buildings had more pressing priorities such as emergency repairs or remedial works, which were the main focus of volunteer time throughout the period of implementation for SGA.

‘The building that we are involved in, we had so much on our plate, remedial works program, we were completely swamped with work. [SGA] was being done while the committee were extremely busy with other things.’

Many of participants noted that the inclusion of **inappropriate, impractical or unfeasible recommendations** in their action plans was a reason why the actions did not go ahead. Particular reasons for not pursuing actions included:

- Impractical implementation – for example, light fittings in privately-owned areas such as locked parking cages;
- Compliance issues – such as requirements for lights in emergency exits and fire stairs;
- Technical feasibility issues – for example, concerns about risks associated with the use of variable speed drive pumps for pumping water up 44 stories;
- Life cycle considerations – for example, committees were generally unwilling to replace fittings and plant equipment that was relatively new, due to considerations of the life-cycle cost and impact.

‘Most of our equipment here is pretty good and in new and fairly good condition. While you could argue there's some savings in changing it, the savings were fairly marginal for pumps and things like that.’

‘The garage lighting, which is a good idea, was just horrendously difficult practically ... It's effectively a cage and a lot of them are locked. Just getting access would have been a nightmare – it was just too difficult.’

‘We couldn't [install occupancy sensors] in the fire stairs, we've got to keep the fire stairs one on all the time.’

‘The only difficulty we had was to do with reducing the temperature of the swimming pool which caused quite a fuss – just a one degree change is noticed by frequent swimming pool users so that was resisted.’

Very few water saving initiatives were implemented in the buildings. This is because common water use is extremely low, and because water is not metered separately – and thus individual users have no financial incentive to save water.



'Water is not separately metered in [apartments in] New South Wales, and therefore there's no incentive for individual users to save water.'

4.4 PROJECTS IMPLEMENTED

This section provides an analysis of the various projects implemented under the SGA program. It details the number of projects initiated and their current implementation status, compares those implemented against those recommended in action plans, and provides breakdowns according to technology type and participating buildings. It also provides detailed data on the cost of implemented projects.

4.4.1 SUMMARY OF IMPLEMENTED PROJECTS

Key findings

- 93 projects have been actioned across the buildings surveyed, with 69 total projects completed and 24 currently in progress
- 30% of recommended projects have been completed, with a further 10% currently in progress.

Overall, a total of 69 projects have been completed, with a further 24 in progress. Table 1 shows the number of projects undertaken – both those that have been fully implemented and those that are currently in progress – broken down by technology type. It shows that the most common types of projects implemented involved improvements to lighting.



Table 1: Implemented projects by technology type

Technology type	Projects implemented	Projects in progress	Total projects actioned
Lighting	39	10	48
HVAC	5	4	9
CO sensors	2	0	2
Hot water systems	3	0	3
Renewables	1	0	1
Power factor correction	1	1	2
Building management systems	0	1	1
Variable speed drives	3	1	4
Pool	5	2	7
Voltage reduction	1	0	1
Timers and sensors	0	0	0
Pumps	1	0	1
Insulation	3	0	3
Water	6	5	11
TOTAL	69	24	93

Figure 8 compares the proportion of projects implemented, to the number that were recommended in auditors' action plans. It shows that 30% of recommended projects have been completed, with a further 10% currently in progress. Of the various kinds of projects recommended, lighting projects were the most likely to be actioned.



Figure 8: Actioned projects against recommended projects

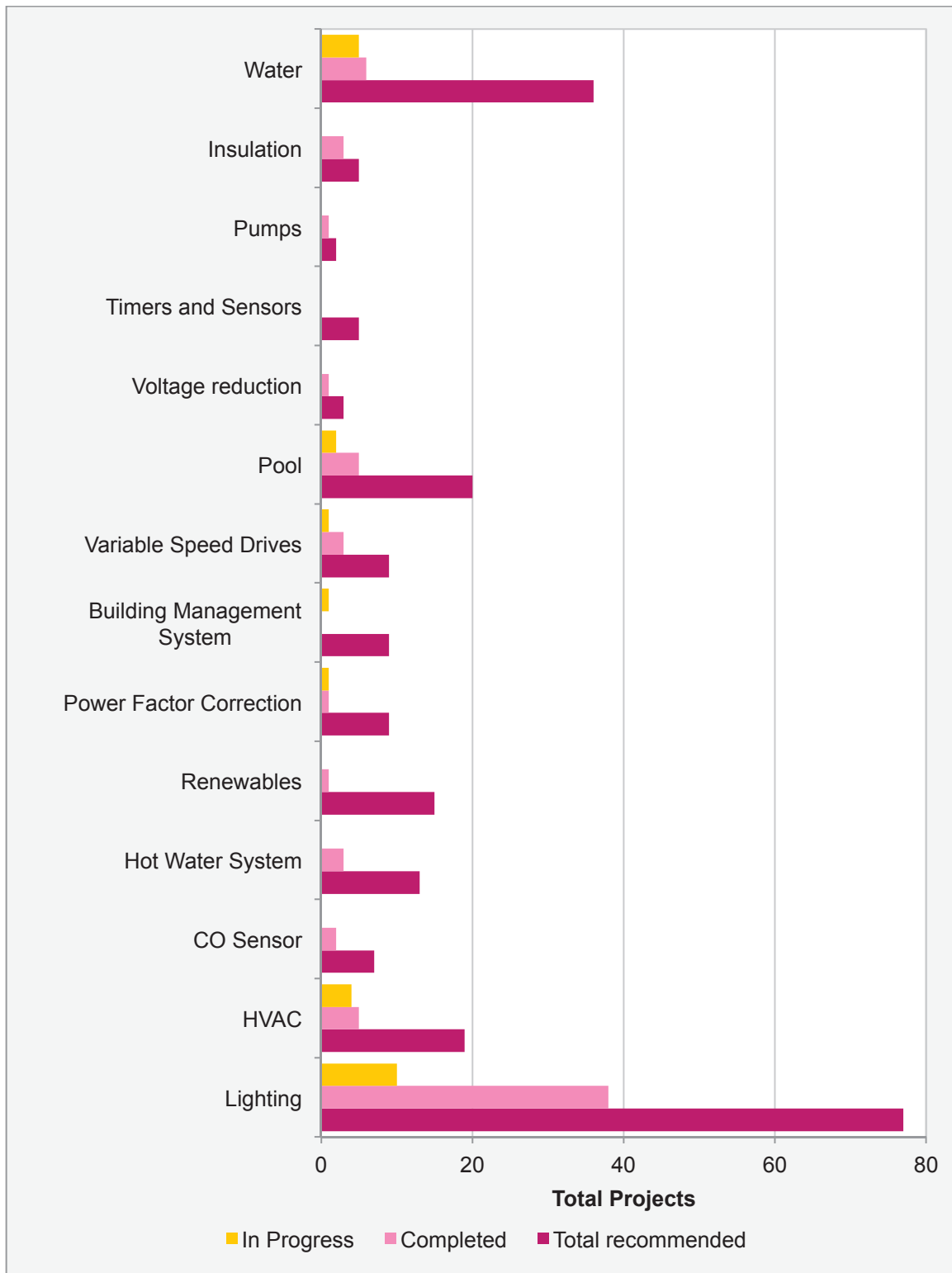


Table 2 shows the number of projects implemented (and currently in progress) in each of the participating buildings. The vast majority of buildings implemented at least two projects, with only one building not taking any action. One participating building, Harbour View, was particularly active with 19 projects completed.

Table 2: Projects implemented by building

Building name	Projects implemented	Projects in progress	Total projects actioned
Aria Apartments	2	0	2
Bauhaus Apartments	0	4	4
Clarence House	0	1	1
Cleveland Mews	3	4	7
Gateway	3	0	3
Goldsbrough	6	5	11
Horizon Apartments	5	1	6
Miramar Apartments	0	2	2
Mondrian Apartments	4	0	4
Motto Apartments	2	0	2
Palisades	0	0	0
Park Lane Towers	0	1	1
Princeton Apartments	2	0	2
Prominence Apartments	6	0	6
Regatta Wharf	4	4	8
Signature Apartments	3	1	4
The Presidio Apartments	2	0	2
Trio North Apartments	2	0	2
Moreton by the Park	2	0	2
Sydney Wharf	4	0	4
Harbour View	19	1	20

4.4.2 SUMMARY OF COSTS

Key findings

- Total completed project expenditure is \$1,219,726. Expenditure on projects in progress is \$705,224
- Lighting accounts for 63% of total project expenditure



The amount spent on completed projects across the participating buildings was \$1,219,726, with a further \$705,224 being spent on projects currently in progress.⁵ This means that in total, the SGA program has been a catalyst for just over \$1.92 million of investment in resource efficiency projects across the participating apartments.

Table 3 shows the cost of implemented projects by technology type, and average project costs for each technology area (averages are weighted on proportion of total project cost within each technology area). Lighting projects accounted for the highest proportion of total spending (63%).

Table 3: Cost of projects implemented for each technology category

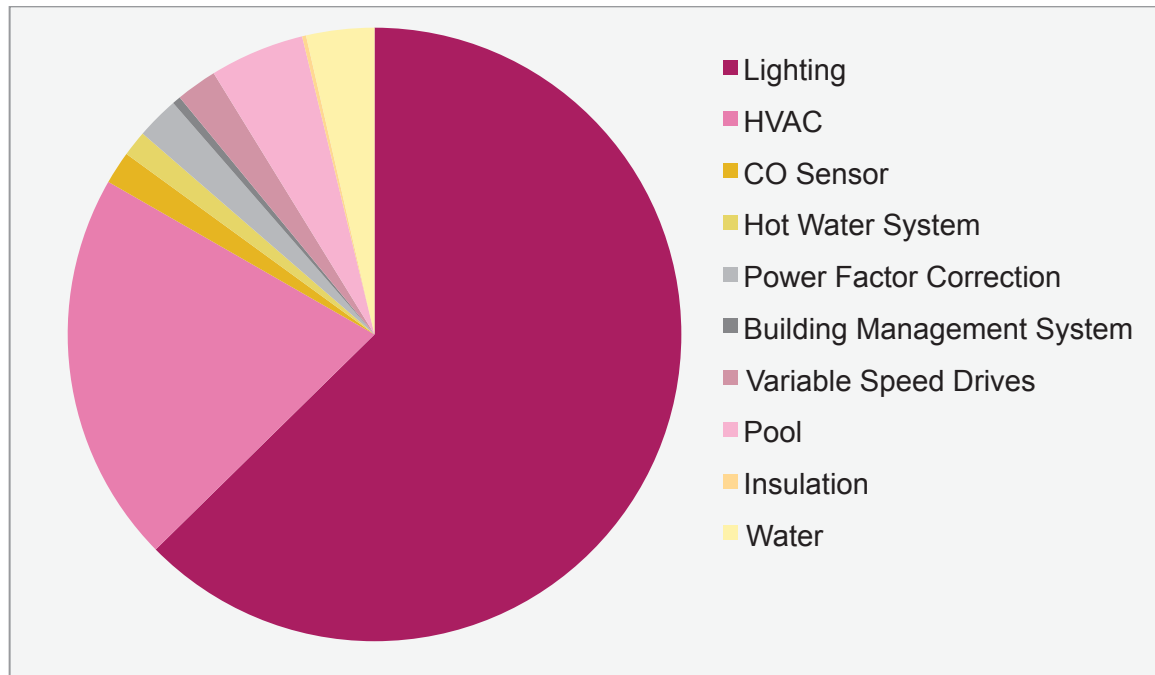
Technology	Cost of projects implemented	Cost of projects in progress	Cost of total projects actioned	Weighted average project cost
Lighting	\$994,466	\$211,269	\$1,205,735	\$25,120
HVAC	\$12,800	\$384,650	\$397,450	\$44,161
CO Sensors	\$33,275	\$0	\$33,275	\$16,638
Hot Water Systems	\$26,000	\$0	\$26,000	\$8,667
Renewables	\$0	\$0	\$0	\$0
Power Factor Correction	\$40,000	\$3,173	\$43,173	\$21,587
Building Management Systems	\$0	\$8,600	\$8,600	\$8,600
Variable Speed Drives	\$17,885	\$23,794	\$41,679	\$10,420
Pool	\$91,000	\$5,000	\$96,000	\$13,714
Voltage Reduction	\$0	\$0	\$0	\$0
Timers and Sensors	\$0	\$0	\$0	\$0
Pumps	\$0	\$0	\$0	\$0
Insulation	\$4,000	\$0	\$4,000	\$1,333
Water	\$300	\$68,738	\$69,038	\$6,276
TOTAL	\$1,219,726	\$705,224	\$1,924,950	\$20,698

⁵ Expenditure is calculated from data on actual costs provided by buildings where available, and otherwise calculated using the expenditure estimates in action plans adjusted (as relevant) based on what was actually implemented.



Figure 9 shows a breakdown of the total investment made by all the participating buildings, indicating that lighting projects accounted for the majority (63%) of this investment. HVAC improvements were the next most significant, accounting for just over 20% of the total investment.

Figure 9: Percentage breakdown of total project capital cost by technology type



4.5 EXPERIENCE OF IMPLEMENTING PROJECTS

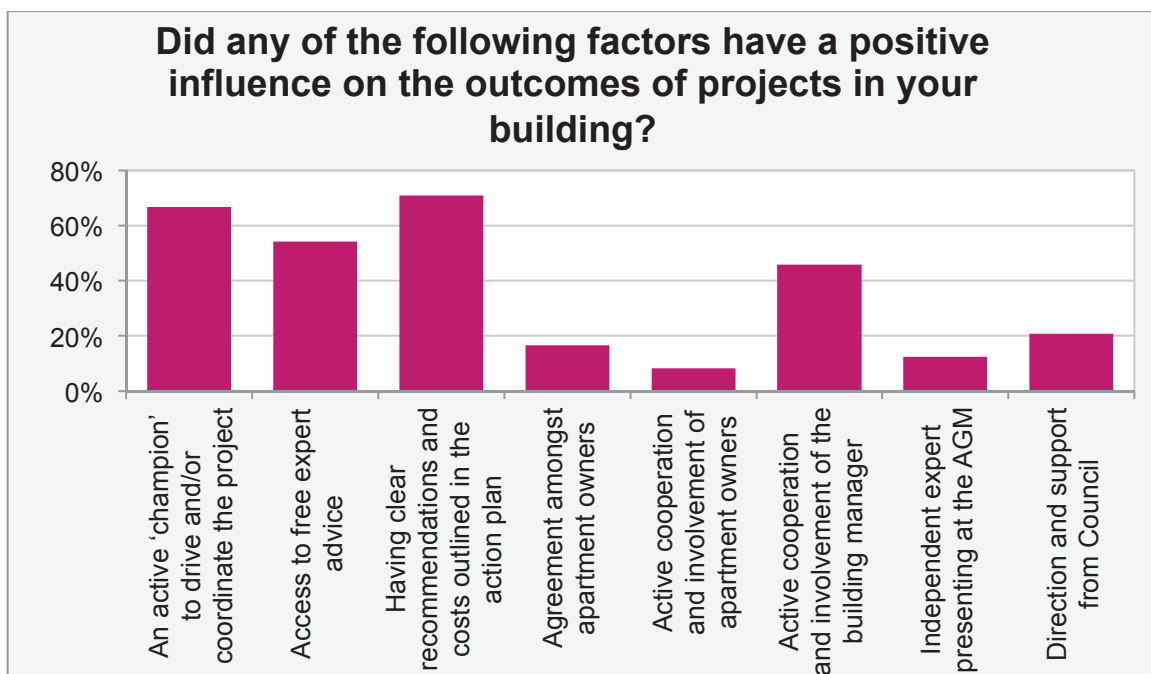
Key findings

- Having an active champion was identified by many participants as being a key factor that helped them implement projects
- Most buildings did not experience issues when implementing projects
- Buildings experienced difficulties finding the technology or contractors recommended in the action plan
- The vast majority of respondents were satisfied with the projects they had implemented.

Respondents to the survey were asked to identify success factors that assisted in the implementation of projects. The most popular response was ‘having clear recommendations and costs outlined in the action plan’ (71% of respondents), indicating that clarity about suggested actions and likely outcomes were key factors. Having ‘an active champion to drive and/or coordinate the project’ was also a commonly-identified factor for success, with 67% of respondents selecting that option.

‘Access to free expert advice’ was also a popular response as shown in Figure 10, with 54% of respondents identifying this as a factor. The importance of having a cooperative building manager was identified by 46% of respondents as a key positive influence on the successful outcomes of the projects.

Figure 10: Factors that positively influenced project outcomes

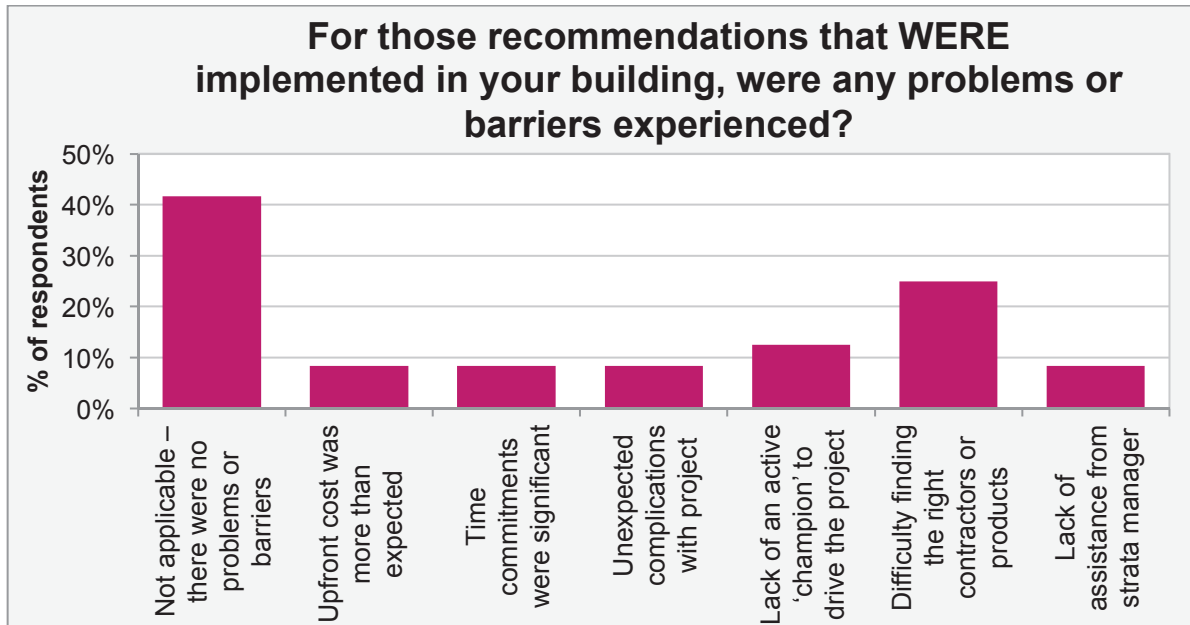


The survey asked respondents to identify barriers that were experienced when implementing projects in their building. As Figure 11 shows, 42% of respondents



said that they did not experience any problems or barriers. The most common difficulty experienced was reported to be ‘difficulty find the right contracts or products’ (25% of respondents selected this option), followed by ‘lack of an active champion to drive the project’ (12.5% of respondents).

Figure 11: Problems and barriers experienced in the implementation of projects



Throughout interviews, a few respondents indicated that difficulties in getting the same fittings recommended by the contractor arose, however this generally didn’t prevent them from implementing actions – though often with some variation on the original recommendation.

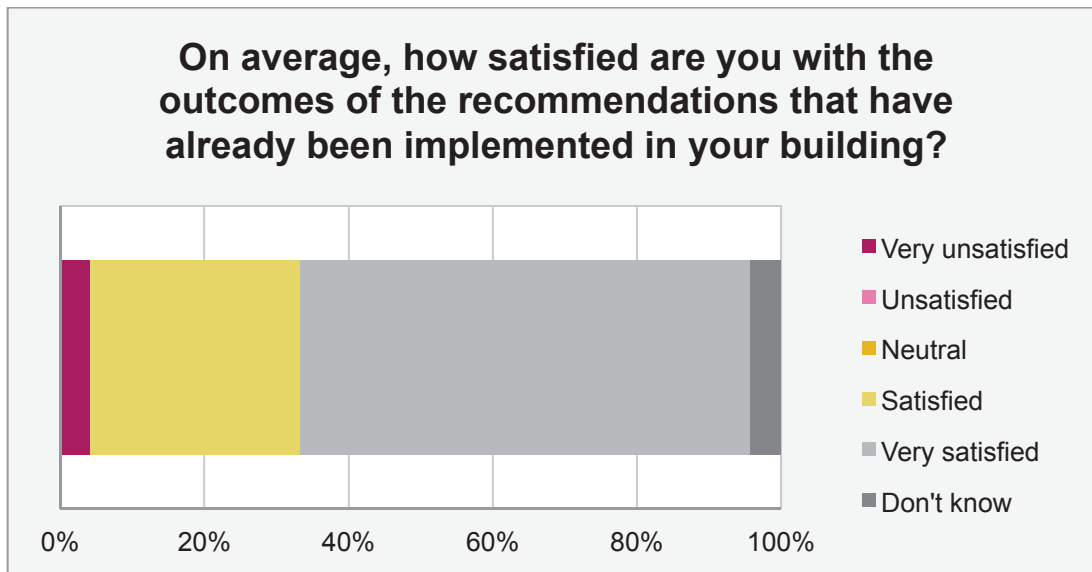
‘We did have some problems getting the lights ... when we ordered them we couldn’t get them all.’

Overwhelmingly, respondents to the survey indicated that they were pleased with the outcomes of the projects that have been implemented in their buildings, as Figure 12 shows. 63% of respondents indicated they were ‘very satisfied’ with the implementation, and a further 29% indicated they were ‘satisfied’. Only one respondent indicated they were ‘very unsatisfied’.

Key reasons identified for their level of satisfaction included the energy and cost savings achieved, while others indicated that only some recommendations were implemented but that ‘more could have been done’, suggesting that dissatisfaction stemmed from incomplete implementation of the action plan.



Figure 12: Reported satisfaction with outcomes of projects implemented



4.6 SAVINGS ACHIEVED BY PROJECTS

This section provides the savings achieved by the various projects implemented in the participating buildings. It considers savings in energy use, operational costs, greenhouse gas emissions, and water.

4.6.1 PROJECT SAVINGS SUMMARY

Implemented projects made significant savings in energy consumption, operational costs and greenhouse gas emissions. Water savings were small, as a result of the smaller number of water related projects implemented under the SGA program.

Key findings

- Annual energy consumption savings are estimated at 2,655 MWh for completed projects, and 569 MWh for projects in progress
- Energy consumption savings are estimated at 33,612 MWh over the lifespan of the technologies installed or being installed
- The total annual operational cost saving for completed projects is \$397,845, with \$103,918 savings for projects in progress
- Annual greenhouse gas savings are equal to approximately 2,627 tonnes-CO₂e for completed projects, and 564 tonnes-CO₂e for projects in progress
- Greenhouse gas savings are estimated at 33,276 tonnes-CO₂e over the lifespan of the technologies installed or being installed
- Total annual water savings are 11ML for completed projects, and 24ML for projects in progress



Table 4: Annual energy savings for each technology type details the energy savings achieved for each technology type. It shows that the majority of energy savings were attributable to improvements in lighting.

Table 4: Annual energy savings for each technology type

Technology	Projects implemented (MWh)	Projects in progress (MWh)	Total projects actioned (MWh)
Lighting	1,503	349	1,852
HVAC	44	114	158
CO sensors	22	0	22
Hot water systems	127	0	127
Renewables	0	0	0
Power factor correction	0	0	0
Building management systems	0	0	0
Variable speed drives	157	82	239
Pool	371	24	395
Voltage reduction	27	0	27
Timers and sensors	0	0	0
Pumps	403	0	403
Insulation	0	0	0
TOTAL	2,654	569	3,223

Associated greenhouse gas emission reductions are calculated from energy savings as shown in Table 5, and current scope 2 and 3 emissions factors.



Table 5: Annual GHG emission reductions across all projects

Technology	Projects implemented (tCO ₂ -e)	Projects in progress (tCO ₂ -e)	Total projects actioned (tCO ₂ -e)
Lighting	1,488	346	1,834
HVAC	43	113	156
CO sensors	22	0	22
Hot water systems	126	0	126
Renewables	0	0	0
Power factor correction	0	0	0
Building management systems	0	0	0
Variable speed drives	156	81	237
Pool	367	24	391
Voltage reduction	27	0	27
Timers and sensors	0	0	0
Pumps	399	0	399
Insulation	0	0	0
TOTAL	2,627	564	3,191



Table 6 below displays average technology lifetimes⁶, and savings over the average life of each technology with respect to electricity consumption, greenhouse gas emissions and electricity costs. Savings have been calculated based on figures found in Tables 5 and 6. Technology replacements have not been considered for the below calculations. Savings presented in Table 7 represent an idealised scenario, and should only be used to convey the *potential* savings a particular technology might be able to achieve over its service life.

Table 6: Savings over technology lifetime

Technology	Technology life-span (Years)	Savings over technology life-span (MWh)	Savings over technology life-span (tCO ₂ -e)	Savings over technology life-span (\$) ⁷
Lighting	10	18,523	18,338	\$3,558,232
HVAC	15	2,370	2,346	\$478,032
CO sensors	8	176	174	\$33,544
Hot water systems	15	1,904	1,885	\$384,050
Renewables	N/A	0	0	0
Power factor correction	10	0	0	\$126,140
Building management systems	10	0	0	0
Variable speed drives	10	2,391	2,367	\$459,333
Pool	10	3,947	3,907	\$758,147
Voltage reduction	10	270	267	\$51,867
Timers and sensors	10	0	0	0
Pumps	8	4,030	3,990	\$774,163
Insulation	10	0	0	0
TOTAL	-	33,612	33,276	\$6,623,796

⁶ Pitt & Sherry (2013) *Greenhouse Gas Abatement Cost Curves: Residential sector* (reference and extracts from this report were provided by City of Sydney)

⁷ Electricity price forecasts are informed by regulatory reviews and ACIL Allen



Water savings from the 6 completed projects were estimated based on projected savings from action plans and descriptions of whether implementation varied from the original recommendation. Across these projects, an estimated 11ML of water was saved (**Table 77**).

Table 7: Annual water savings across all projects

	Projects implemented (ML)	Projects in progress (ML)	Total projects actioned (ML)
Water savings	11	24	35



Table 88 displays the estimated annual operational savings achieved and anticipated to be achieved for the various types of sustainability projects with a total estimated \$646,202. These savings have been calculated using data on actual savings where provided by buildings, and otherwise using action plan estimates, adjusted (where implementation deviated from recommendations) to reflect what was actually implemented.

Table 8: Operational cost savings per annum (\$) for each technology area

Technology Area	Projects implemented (\$)	Projects in progress (\$)	Total projects actioned (\$)
Lighting	\$291,563	\$67,969	\$359,532
HVAC	\$12,826	\$0	\$12,826
CO sensors	\$4,241	\$0	\$4,241
Hot water systems	\$18,951	\$0	\$18,951
Renewables	\$0	\$0	\$0
Power factor correction	\$6,981	\$1,231	\$8,212
Building management systems	\$0	\$0	\$0
Variable speed drives	\$18,868	\$15,560	\$34,428
Pool	\$40,524	\$1,482	\$42,006
Voltage reduction	\$3,234	\$0	\$3,234
Timers and sensors	\$0	\$0	\$0
Pumps	\$403	\$0	\$403
Insulation	\$0	\$0	\$0
Water	\$35,570	\$126,800	\$162,370
TOTAL	\$433,160	\$213,042	\$646,202

Table 99 indicates key savings indicators of energy and cost savings by building including the average payback period for those projects included.



Table 9: Savings summary by building

Building Name	Total project savings p/a (MWh)	Percentage Saving against common-area baseline (%)	Total project savings p/a (\$)	Payback period (years)
Aria Apartments	77	5%	\$12,428	0.7
Bauhaus Apartments	17	3%	\$2,873	7.0
Clarence House	11	10%	\$2,097	1.2
Cleveland Mews	236	81%	\$33,914	2.5
Gateway	368	47%	\$72,822	1.6
Goldsbrough	183	14%	\$32,207	2.8
Horizon Apartments	288	17%	\$49,567	15.4
Miramar Apartments	39	3%	\$6,618	3.3
Mondrian Apartments	73	30%	\$14,221	4.8
Motto Apartments	74	20%	\$14,897	1.5
Palisades	0	0%	\$0	
Park Lane Towers	120	25%	\$27,268	3.3
Princeton Apartments	3	1%	\$610	6.1
Prominence Apartments	493	85%	\$19,231	3.8
Regatta Wharf	298	26%	\$52,977	1.9
Signature Apartments	32	24%	\$6,682	2.8
The Presidio Apartments	41	16%	\$7,034	1.4
Trio North Apartments	8	3%	\$2,027	1.7
Moreton by the Park	91	31%	\$20,431	2.6
Sydney Wharf	432	29%	\$88,460	1.7
Harbour View	343	89%	\$35,401	5.1



4.7 MONITORING THE SAVINGS

Key findings

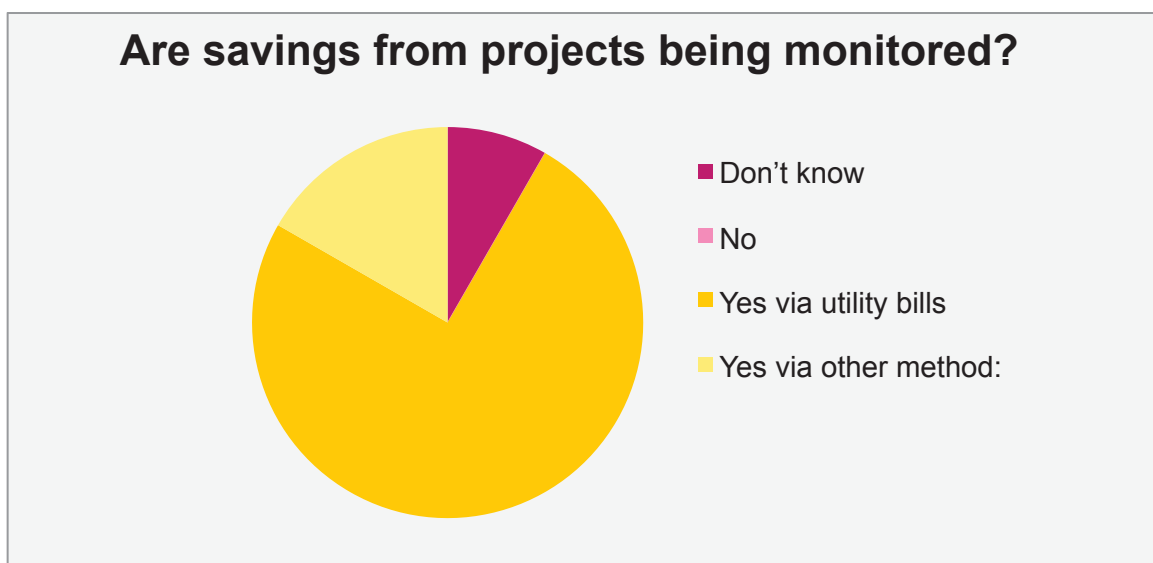
- Despite reporting that they were monitoring several metrics in the survey, interviews revealed that very few participating buildings were monitoring savings
- No clear expectations were established that guided participants to collect data on implementation
- Savings were generally only being monitored using crude means such as comparing costs of monthly bills. There was no rigorous monitoring to note when projects commenced or were completed, and thus identifying the actual impact of projects upon bill savings is almost impossible.

Monitoring is an important element of the program design of any project as it allows organisations to track whether or not projects are meeting their objectives and to understand outcomes and consequences. Monitoring assists program managers to understand whether the program had an impact upon energy consumption, and whether certain actions were more effective than others.

Buildings managers were most commonly identified as being responsible for monitoring savings, follow by the executive committee and then strata managers. 32% of respondents indicated that the strata manager was responsible for monitoring savings – this may be a potential concern for buildings where getting strata managers on board was identified as a barrier.

As shown in Figure 13, 75% of respondents indicated that they were monitoring savings via utility bills, with an additional 17% monitoring savings via other methods, including sub-metering. No respondents said that they were not monitoring savings.

Figure 13: Proportion of buildings that claim to be monitoring projects

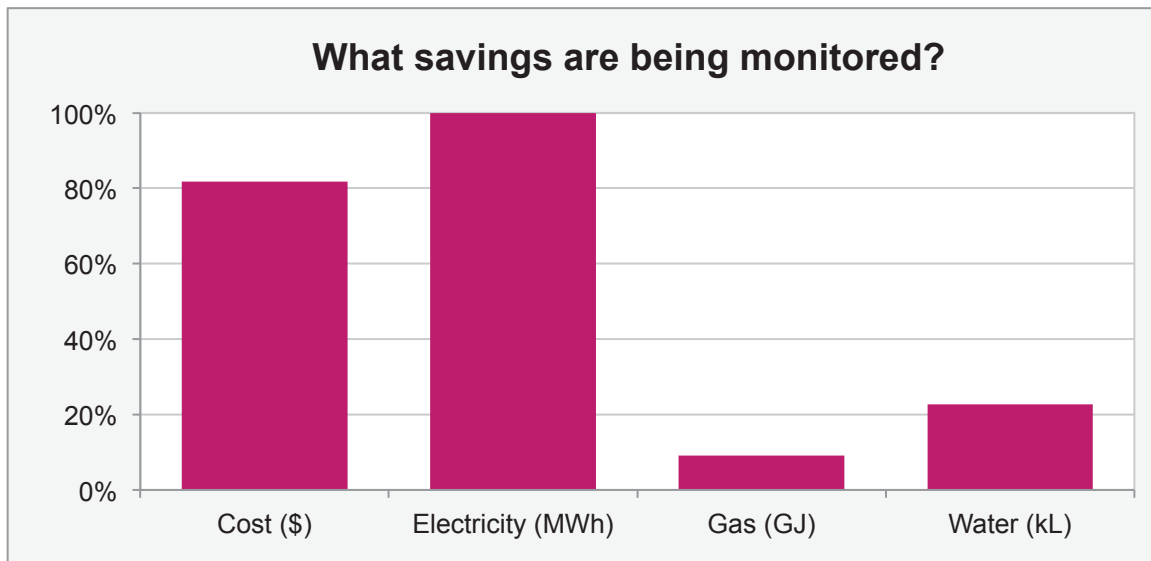


All respondents reported that they are monitoring savings from electricity, and 82% are monitoring cost savings. As Figure 14 illustrates, only 9% of respondents



reported they were monitoring savings in gas consumption, however 23% were monitoring water savings.

Figure 14: Metrics reportedly being monitored by buildings



In contrast to the self-reported survey findings, more detailed interviews found that rigorous monitoring of savings was **not** being undertaken in any of the participating buildings.

It was revealed that most buildings were not maintaining a log of information about when projects were commenced or completed, the exact details of implementation or the ways in which implemented projects deviated from those recommended in action plans (for example, how many light fittings were actually upgraded). This complicates tracking of savings, as it makes it extremely difficult to define a point at which changes happened; thus it is difficult to identify a point at which savings might be expected to be realised in billing data.

None of the participants were able to monitor the savings that were achieved from the implementation of an isolated action. Most were only able to identify a saving on a bill from a particular period, however weren't able to account for other variations such as seasonal changes, or to separate savings that might have been achieved through the implementation of multiple projects simultaneously. Further, no interview respondents were monitoring kilowatt hours (kWh), kilolitres (kL) or gigajoules (GJ) saved through implementation, and were keeping track only of (rough) dollar figures that they had saved since implementation.

'We don't have enough metering throughout the building to isolate a specific savings, an area of savings.'

'All the green initiatives we took were [implemented] at the same time we were doing a major home-owners warranty remedial works program. All the site huts that occupied the site for about eight or nine months were all drawing power from the common power source. So our data on common park tower would show no savings, because we had a whole lot of black outs.'

Even for those buildings that were able to provide some indication of total savings achieved through all projects implemented, they were not able to provide an



indication of how comparable the billing data they were referring to was – that is, if they were comparing bills from similar months or seasons or whether other factors might have influenced billing data. Without a means to log billing data such as a spreadsheet or other tool, participants were not keeping track with any rigour or consistency.

The inability to report on other metrics such as kWh, may be an indication of poor energy literacy among participants. Energy literacy refers to consumers' understanding of various concepts relating to energy. This includes relevant units, including differentiating 'power' (kW) from 'energy' (kWh), and understanding how much a unit of energy costs, as well as how much power various appliances consume. Further, it relates to consumers' ability to read and understand energy bills. Interviews indicated that few participants knew how to interpret their bills, possibly suggesting a need to deliver education to improve energy literacy among participants to enable them to interpret and collect the data needed to monitor the implementation of actions.

In a program that involves incentives for implementation, these may be tied to the collection and submission of data. For example, a building or individual might be limited in their ability to collect an incentive until they have logged and submitted data relating to monitoring of implementation and savings. This will help to ensure that monitoring is conducted and the rigour of evaluation processes is improved.

4.8 ENGAGEMENT, CAPACITY BUILDING AND BEHAVIOUR CHANGE

4.8.1 PROGRAM COMMUNICATIONS

Key findings

- Communications throughout the program were perceived by participants to be adequate to meet their needs
- Buildings would have benefitted from a summary of government incentives, rebates and programs that relate to energy efficiency and renewables
- Participants enjoyed the opportunity to communicate and share information with stakeholders from other buildings, however would have appreciated further follow-up from these meetings and other opportunities to communicate such as an online forum.

Generally, participants believed that the communications throughout the program were adequate to meet their needs in implementing the projects.

However, participants identified a number of ways in which they felt communication and information could have been improved, including:

- Provision of summary information in languages other than English, for apartment buildings where a large number of resident do not speak English:

'In some buildings in the city there could be as much as 30 per cent of [participants] that are [involved in the programs] that don't speak English.'



Now, obviously the reports that [the consultants] provide to us are in English. Then it's up to us to try and convert that into different languages or pie charts and graph so that they can understand it even better.'

- Provision of information regarding government schemes and rebates that relate to energy efficiency, such as ESCs and renewables rebates, to allow executive committees to understand the opportunities that are available to them.

'Right now for example, I've really no idea what each branch of government offers to individual homeowners and to owners' corporations or to commercial businesses by way of the current energy [savings] incentive ... So a mechanism for [providing] that information and updates of it would be very useful.'

- Provision of information to follow up on meetings and workshops. Several residents noted that they were very disappointed that they did not receive any further information or contacts after attending a session with representatives from other buildings.

'[There was] no follow-up from a seminar that was attended by other people representing strata buildings. It would have been useful to have feedback.'

- Coordination of information sessions within apartment blocks that might identify common actions, outline strategies and explain key concepts, in order to ensure that executive committees are equipped with the knowledge that they need to make decisions.

'Information sessions hosted in an apartment in our block could show common problems and solutions.'

- Provision of an online forum that apartment owners could use to communicate about common challenges, and seek advice from other executive committees in other participating buildings about possible approaches and solutions.

'Make the website a forum for peer discussion of questions, problems and suggestions.'

Buildings are currently communicating information about money, energy and water being saved using a range of methods. These include:

- AGM presentations and distribution of charts showing savings
- Executive committee meetings and minutes of these meetings
- Resident newsletters
- Information displayed on screens throughout the building
- Communication about the positive impacts of the projects on the sinking fund to owners.



4.8.2 PEOPLE AND RELATIONSHIPS

Key findings

- Generally, participation was driven by one or two key motivated residents in each building
- Participants did not believe that participating in the program had contributed to building community spirit within apartment buildings
- Participants reported that the opportunities to connect with representatives from other apartment buildings and share knowledge with them were the most valuable opportunities provided by the program
- Participants would have liked more information following on from these forums and would have appreciated more opportunities to collaborate with their peers.

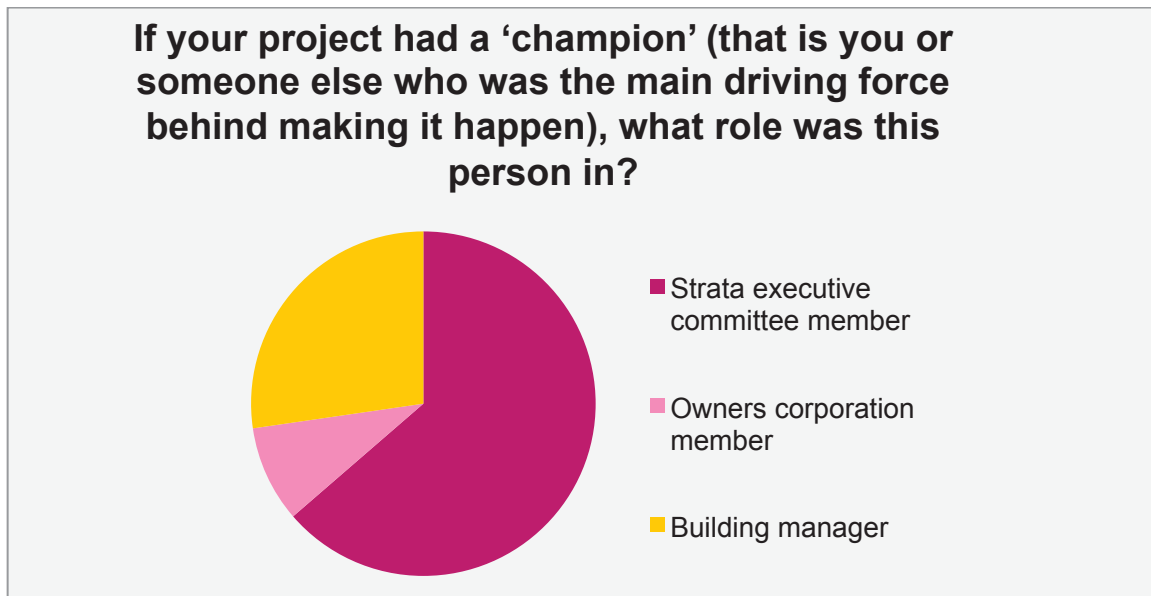
Interviews and surveys sought to understand how people worked together to implement the projects listed in the action plan. Generally, projects were driven by one or two key motivated residents.

'Most people don't pay attention in whatever is going on, because they're too busy with their own lives. Something like 20 per cent will pay attention if they think there's something relevant to them. About five per cent will actually get involved and one per cent does all the work. In most communities, it's the one per cent of the people who are interested and willing and donate their time to push these projects forward, otherwise they'd never happen.'

'It's usually the champion dragging along the people, showing them why they should say yes, and then they raise their hand and say yes.'

Having 'an active champion to drive and/or coordinate the project' was a commonly-identified factor for success by respondents to the surveys. 67% of all respondents noted that having an active champion to drive and coordinate the project had a positive influence on the outcomes of projects in their building. Responses to the survey identified that champions were most commonly members of the strata executive committee, or otherwise were commonly building managers, as shown in Figure 15.



Figure 15: Roles of champions

Respondents noted a variety of ways in which champions contributed to project success, ranging from ‘enthusiasm’ and being proactive/taking initiative to having ‘technical understanding’. Some champions were responsible for taking on the paperwork, coordinated the building’s involvement, liaised with stakeholders and developed implementation plans. One respondent noted, “without the champion pursuing the cause, nothing would have been done”, highlighting the significance of having a champion to drive projects.

Interviewees noted that, generally, there were no objections to participation in the program (despite some objections to the attempted implementation of individual actions). However, this also tended to correlate with a relatively unengaged resident base, meaning that little support was provided for those leading the projects.

‘We had zero problems with residents, tenants, or owners during the work that was done analysing our building and fixing all that.’

‘We have a very happy building in the sense that there was no dissention. But conversely, we’ve got almost zero participation. People aren’t very interested in the community affairs here. One reason may well be that there’s no issues and the building’s fine and everything’s good, so they don’t get involved.’

Interviewees did not believe that their participation in the program had led to any kind of community building in their apartment complex – most noted that it was simply an extension of the way in which the executive committee worked together on a usual basis. Many interviewees appeared to be somewhat baffled by the idea that the program might have intended to create a positive impact on community building within participating buildings.

‘There was good communication throughout the program with residents, but no real community building outcomes.’

Many respondents to the interview believed that establishing connections between residents and executive committees in different buildings was a key beneficial



outcome of this project – rather than the building of community with apartment complexes.

‘Bringing together interested participants from other buildings who all have good ideas, so bringing new, good ideas from different people [was what I liked about the program].’

‘The most important thing were these regular meetings that the council hosted, where we’d meet with other representatives of - well, there were about 12, 14 representatives of other buildings that were in the pilot program, all turned up once a month.’

However, several interviewees indicated disappointment that they had not received any follow up from the meetings hosted by Council. Interviewees noted that they would like to have received information, contact details and other opportunities to communicate with other attendees of the forum.

[You need to] have a website for discussion for interested parties, because that was the obvious gap – the fact that we had three or four, five or six meetings at the Town Hall and people came along with their great ideas and their experience and thinking it was great work, then I never saw them again. I didn’t have their contact and I lost contact and I’ve never spoken to them since.

4.8.3 CAPACITY BUILDING

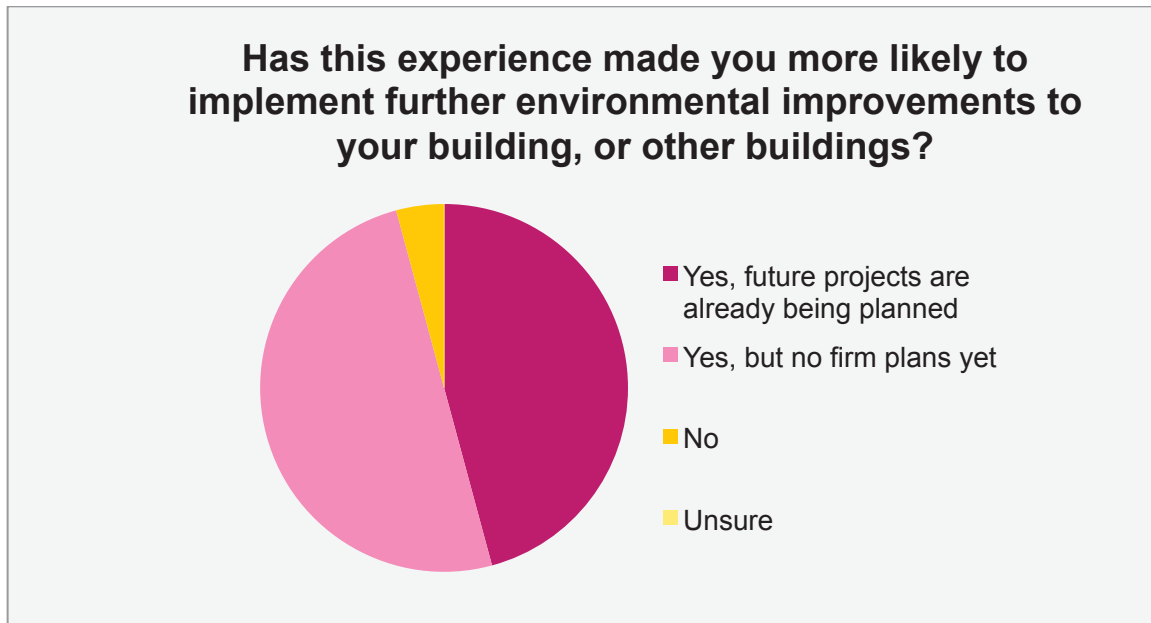
Key findings

- Participating in the SGA program helped participants to gain new knowledge and broaden their understanding of how to improve energy efficiency in their apartment building
- Building managers found the program to be useful in that it allowed them to understand how to deliver energy cost savings in apartment buildings.

Respondents indicated that the experience of participating in SGA has made them more likely to implement further environmental improvements – 96% of respondents indicated that they had intentions to do so, with 46% selecting that they already have plans for future projects as shown in Figure 16. Only one respondent said that the experience had not made them want to implement further environmental improvements.



Figure 16: Reported likelihood that participants will implement further improvements after participating in the SGA program



Interviewees indicated that they believe that the program had given them new ideas and knowledge about efficiency opportunities in apartment buildings, and that it allowed them to talk with more confidence about how to implement efficiency projects.

'Yeah, definitely it provided me with new knowledge about how to be more efficient [in apartment buildings].'

'I feel that I have learned quite a lot over it and could do it quicker in the future with that knowledge I guess.'

Two interviewees who were architects indicated that they were also able to utilise the new knowledge gained through participation in the program to provide advice on energy efficiency to clients:

'It's quite interesting working on newer projects and speaking to clients about some of the simple things that can be done to allow building into the future.'

'Yes [it provided me with knowledge and ideas about energy efficiency in apartments], ... because I'm a still semi-practicing architect.'

92% of respondents indicated that their involvement in the SGA program improved their understanding of environmental performance issues in apartment buildings. Only two respondents indicated that it had not improved their understanding.

Several building managers noted that they were pleased that the program had provided them with an opportunity to learn more about delivering energy cost savings in apartment buildings.

Participants were asked to identify factors that might make them more likely to make further environmental improvements to their building. Participants described a 'compelling business case' as being a key element, including short-term paybacks, further savings and also financial support such as loans or subsidies to



implement projects. Participants also mentioned networking and sharing of knowledge between strata members as being key to further achievements, as well as easier methods of measuring and monitoring water usage.

Interviews revealed that participants may have benefitted from receiving targeted information and education relating to the following themes:

- Energy literacy
- Rebates, incentives and government schemes relating to energy efficiency
- Interpreting bills.

4.8.4 FUTURE PROJECTS

Key findings

- Many buildings have future projects planned as a result of their participation in the SGA program, and participants want to continue to share knowledge
- There is some interest in addressing resource use within individual units

Although several buildings are still in the implementation phase of their participation in the program, others indicated that they are looking to future steps.

Respondents indicated that they would like to pursue options for further savings, and identified tools that might assist them in doing so, including:

- *'We are participating in an auction for a group price for electricity. I would like to investigate whether we could get similar group savings if all owners were to sign up to co-ordinating energy bills'*
- *'It didn't cover the individual apartments' energy usage ... a supplementary program where owners could voluntarily join in the program [would be a good next step]. I think you would get a fair response and some additional benefits because you've got energy savings from apartments, not just from the common areas'*

Other participants indicated that they would like the opportunity to continue to meet with representatives from other apartment buildings to continue to share knowledge and experiences about managing strata complexes and implementing projects.

4.8.5 PARTICIPATION IN THE SMART BLOCKS PROGRAM

Key findings

- Some SGA program participants have joined the Smart Blocks program, but more could be done to encourage others to join
- Those who joined Smart Blocks had varied responses to the website



29% of survey respondents indicated that they thought their building had joined the Smart Blocks program. 38% of respondents were unsure whether their building was registered. Those who had not yet joined indicated that they needed more information to determine the value of the program, and that being offered networking opportunities with others involved in Smart Blocks would provide a good incentive to become involved. Assistance with specific projects (such as PV installation) was also mentioned as a potential incentive for joining the program.

Experiences dealing with the Smart Blocks website varied greatly – several respondents found it a positive tool, describing it as ‘impressive and useful’, ‘helpful’ and ‘really good for buildings starting along the path’. However, others described it as ‘clunky’ and said that ‘nothing grabbed their attention’ and so have not returned to the site.



5 RECOMMENDATIONS

These recommendations have been structured to align with a program logic framework, typically used to develop behaviour change programs. This is to support the easy integration of recommendations into the next stage of program design (or the design of related initiatives) by the City of Sydney.

5.1 PROGRAM DESIGN AND PLANNING

The following recommendations are relevant to the program design and planning phase of any future iterations or adaptations of the SGA program.

Table 10: Recommendations for Future Program Design and Planning

1.	<p>Establish a project plan, incorporating a framework such as program logic, to that will be used to guide program implementation and evaluation. Aspects to be covered in the project plan include:</p> <ul style="list-style-type: none"> • program objectives • performance indicators and measures • data collection requirements to ensure that project and program level impacts can be measured • any incentives for participants that will be provided at recruitment or other stages • desired short-term, intermediate and long-term outcomes. This ensures consideration of both the longer-term change the program seeks to contribute to, and how it could become self-sustaining over time • learning, reflection and capacity building opportunities for participants and program managers.
2.	<p>Establish a clear plan and set of procedures for data collection. This should be developed in parallel with the project plan, and should:</p> <ul style="list-style-type: none"> • specify data to be collected, the format, when, and by whom • enable project status to be tracked, including project start and end dates, and details of how projects deviate from the original action plan recommendations • establish a baseline, or detail how a baseline will be established (ideally, several years of pre-intervention data are required to establish a reliable baseline) • ensure data collection procedures are specific enough to enable a range of different savings to be tracked, including kWh, GJ, kL and financial savings • provide a user-friendly template for participants to enter data into, to support ease and consistency of data collection • identify capacity building opportunities and strategies to support participants in meeting their data collection responsibilities.



3.	<p>Consider providing incentives for the collection and timely delivery of the required data. This may help raise awareness about data collection.</p>
4.	<p>Explore the option of release of billing data by utilities, as an alternative to asking participants to collect savings data. This would require participants to sign consent forms authorising utilities to release this data to the program manager. (Participants should still be required to track and report project implementation data themselves).</p> <p>Note that while this approach has the potential to improve accuracy and streamline data collection by removing the need to seek the cooperation of multiple buildings, it may prove challenging to negotiate with utilities. Furthermore, encouraging program participants to collect billing data themselves can help to build their data literacy and could therefore have more positive long-term outcomes. These considerations should be weighed up at program design stage.</p>
5.	<p>Establish a Communications and Engagement plan, to accompany the project plan. The plan should identify</p> <ul style="list-style-type: none"> • target audiences and other stakeholders important to the program • key messages of the program, based on the objectives • engagement methods to be used including a specific strategy for identifying and engaging ‘project champions’ for each building • capacity building activities • timeline of anticipated engagement points • relevant networks to be used • reporting requirements. <p>The development of the plan should consider a targeted approach to more effectively engage strata managers in future programs</p>
6.	<p>Explore ways to incentivise and communicate the benefits of water and waste projects to increase implementation rates. Given financial drivers were identified as such an important factor in decision making, energy projects tended to be prioritised (and within energy, ‘quick wins’ such as lighting dominated). If an increase in water and waste projects is to be encouraged, emphasis of non-financial benefits (e.g. waste avoidance, environmental benefits, compost for gardens) will be important.</p>
7.	<p>Consider involving key stakeholders in co-designing the next iteration of the program, for example, stakeholder groups such as Strata Community Australia and Green Strata. This not only ensures program design is considered from a number of angles, but helps to create a sense of ownership that can make the implementation process smoother.</p> <p>Note however, these stakeholders are likely to be time-poor, so any process would need to take care to engage them efficiently and effectively early in the program design stage, and ensure they were able to have genuine influence on the program design.</p>



5.2 RECRUITMENT PHASE

The following recommendations are made as a means to improve the recruitment of project participants.

Table 11: Recommendations for Recruiting Participants in future programs

8.	<p>Consider using past project ‘champions’ to help promote the program and recruit new participants, by sharing their own experiences in program communications materials and at networking events. People like to learn from their ‘peers’ and tend to trust them. Given the research indicated how time poor project champions tend to be, some form of incentive/remuneration would be appropriate, and likely necessary.</p>
9.	<p>Tap into existing networks and lines of communication relevant to the target audience/s to distribute information about the program. Messages coming from ‘trusted networks’ help to build engagement. Networks could include local area community groups, environment groups, schools and relevant stakeholder organisations such as Strata Community Australia, Green Strata and the Facility Management Association of Australia.</p>
10.	<p>Focus on identifying an active project ‘champion’ for each building early in the recruitment phase. Focus on supporting these champions throughout the program.</p>
11.	<p>Ensure that the recruitment information package provides sufficient information about the program and what is required of participants. It should specify the program’s overall objectives, outline the potential benefits to participants, provide participants with a sense of the likely time and resource commitments required, and identify the support available.</p>
12.	<p>Ensure participants understand and commit to data collection requirements upon sign-up.</p> <p>Note: if the program plans to seek data release by utilities, consent forms would need to be signed at recruitment stage.</p>
13.	<p>Provide sufficient tools, resources and support to make data collection as easy as possible for participants. This could include a simple data entry template, accompanied by guidelines and training. Ensure participants are aware of these resources and how to access them.</p>
14.	<p>Establish a welcome event to launch the program, introducing ‘champions’ and special guests, with networking opportunities for all participants. This event should reinforce the program’s key messages and provide participants with information on:</p> <ul style="list-style-type: none"> • the program timeline, including future events • mechanisms for keeping participants up to date • available support, training and resources.



5.3 IMPLEMENTATION PHASE

The recommendations in this section relate to three aspects of program implementation, namely information and capacity building for participants, auditing and reporting, and mechanisms to support implementation.

5.3.1 INFORMATION AND CAPACITY BUILDING

There are several ways in which program information and communication strategies could be enhanced, in order to more effectively engage participants and build their capacity to contribute to the program (and to further sustainability initiatives beyond the life of the program).

Table 12: Recommendations for Improving Program Delivery

15.	<p>Expand the range of information, training or other resources made available to participants. Potentially useful information includes technical information, program information and guidance on implementation, such as finding products and contractors.</p> <p>Focus on providing information that address the following specific identified gaps in knowledge:</p> <ul style="list-style-type: none"> • basic energy literacy, including how to interpret bills • monitoring project implementation and savings (tailored to the specific data collection needs of the program) • financial incentives available • understanding and using Energy Savings Certificates (ESCs).
16.	<p>Ensure that the communications and engagement plan includes a strategy for layering and tailoring information to suit the identified needs of the different audiences. Apartment owners alone represent a diverse range of backgrounds and skillsets, and building managers and strata managers have different information needs.</p> <p>Information layering helps to avoid ‘information overload’, which is particularly important for a diverse and time-poor audience⁸.</p> <p>In buildings where a significant proportion of owners come from non-English speaking backgrounds, translation of key documents into the relevant languages should be considered.</p> <p>Consider using a range of formats to suit different preferences and needs, however note that this evaluation found program participants had a general preference for online formats.</p>

⁸ An example of information layering is a ‘glossy’ leaflet that aims to capture people’s interest, which links to a source of more detailed information (such as a website).



- 17. Ensure the program provides face-to-face networking opportunities for participants.** These are widely appreciated by participants; peer to peer interaction is an effective mechanism for motivating participation, learning and change. Provision of follow up information (such as a summary or minutes of the event, contact details of those who attended, or information that was requested by participants) would also be beneficial.
- 18. Consider building an online networking forum into future programs.** Participants expressed significant interest in online networking as a extension to face to face meetings and a means of sharing of knowledge and experience between representatives from different buildings on an ongoing basis. This could be hosted on an existing hub that apartment building stakeholders are familiar with, such as Green Strata (www.greenstrata.com.au) or SmartBlocks (www.smartblocks.com.au).
- 19. Look for opportunities to help build a ‘community of practice’ for sustainable apartments via the program.** A community of practice is a network of professionals or enthusiasts that share knowledge about a particular topic or discipline. If the program can provide the structures to support this, such as forums where connections can be initiated and an online hub for networking, a community of practice may develop and become self-sustaining beyond the life of the program.
- 20. Consider incorporating capacity-building opportunities into networking events.** As networking events are popular with participants, they provide a captive audience to build participants’ base level of knowledge and skills in relation to relevant topics as identified in Rec.15. Events could incorporate short topic-based presentations, and information on opportunities for more intensive training.
- 21. Provide access to short interactive training sessions on relevant topics** (particularly those outlined in Rec.15) to allow interested participants to further their knowledge and skills. These could be incorporated in existing training programs targeted at the apartment sector, such as Strata 101. Given the different responsibilities and skill sets of different program stakeholders, it may be advisable to develop sessions tailored to the differing needs of apartment owners and building managers.

5.3.2 AUDITING AND REPORTING

Audit reports with their targeted ‘action plans’ were a key enabler and source of information for decision making. They should remain a key program element.



However, the sheer amount of information was overwhelming to some participants who weren't able to interpret it effectively.

Table 12: Recommendations for Improving Program Auditing and Reporting

22.	<p>Simplify and prioritise action plan recommendations.</p> <p>Action plans should:</p> <ul style="list-style-type: none"> • prioritise projects with short payback periods (e.g. less than 2 years) to help executive committees identify 'quick wins' • identify which actions are best considered at the end-of-life of a piece of equipment, rather than immediately • ensure recommended actions are feasible in a practical sense and will not contravene legislation. <p>A greater emphasis on prioritisation in this way will help committees make decisions and manage expectations about how many projects are viable, and may enable more projects to be implemented overall.</p>
23.	<p>Provide resources in the program for auditors to present and help 'sell' the action plan recommendations to executive committees and/or at owners corporation meetings.</p> <p>When decisions are being made about which recommendations to implement, participants identified expert input as critical to getting projects 'over the line'. The ability to have the benefits explained and difficult questions about implementation answered is highly valuable at this critical decision making stage.</p> <p>Note: While this opportunity may have been available to all participants in the SGA program, many appeared to be unaware of it, suggesting a need for greater emphasis on this option in program information.</p>



5.3.3 IMPLEMENTATION SUPPORT MECHANISMS

The following recommendations are suggested as ways to improve and support the implementation of projects recommended by the action plans.

Table 13: Recommendations for supporting participants and champions

24.	<p>Provide project champions with access to technical support during project implementation and ensure this option is well advertised.</p> <p>This would consist of direct advice from auditors and/or relevant technical experts, available on an ongoing as-needs basis, and paid for by the program. It could take the form of an expert panel or hotline.⁹</p>
25.	<p>Consider providing project management support to relieve some of the time pressures faced by project champions.</p> <p>This would include assistance with locating suitable products or contractors, organising quotes and installations. Support with monitoring and tracking projects is also likely to be beneficial.</p>
26.	<p>Ensure recognition of performance by champions and their buildings to generate and sustain enthusiasm. This might consist of awards or certificates of achievement. Note that the ability to recognise performance and achievements is dependent on the availability of credible data.</p>
27.	<p>Develop a ‘feedback loop’ to ensure that feedback from participants informs ongoing improvements to program implementation and management.</p>

5.4 MONITORING AND EVALUATION PHASE

Monitoring of project and program key indicators is crucial to long-term building of the sector’s capacity for implementing sustainability projects. The following recommendations relate to the monitoring and evaluation phase of future programs.

Table 14: Recommendations for improving monitoring of projects and performance

28.	<p>Ensure the data collection plan and procedures developed as part of the project plan are properly implemented</p>
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⁹ As part of the SGA program, up to 30 hours of auditor support was available to participants via an implementation support agreement but it appears that only one building made use of this option. As the researchers were unaware of this option at time of conducting the survey and interviews, the project did not explore reasons for such a low uptake. It is possible that the onerous nature of the sign up process was a barrier.



29. Consider establishing an online platform for tracking resource use and benchmarking performance against similar buildings.

A web portal that allows participants to compare their performance with other apartment buildings could provide an incentive for executive committees to monitor their savings data more closely and engage in friendly competition with other buildings.¹⁰

The ability to compare performance has proven to be a motivator to saving energy in single dwellings. However, this approach requires more sophisticated benchmarks that account for the varying scales and characteristics of apartment buildings.

30. Advocate for data improvements in the multi-unit residential sector

While beyond the scope of future program design and implementation, advocacy for the establishment of benchmarks for apartment buildings would support the program's general aim of improving the environmental performance of the sector. The City could, for example, work with NABERS to trial rapidly evolving smart metering and feedback technologies that allow quicker feedback loops to building managers, and build up a dataset for benchmarking.¹¹

¹⁰ The Climate Clubs program is a good precedent. Climate Clubs used friendly competition and self-reporting and benchmarking supported by a tailored online platform to engage householders from school communities to save energy, see: www.climateclubs.org.au. An 'apartments' version could be considered to encourage residents of apartments to work together, in friendly competition with other apartments.

¹¹ A good precedent is Buildings Alive, a high-end online data capture portal for the commercial building sector providing rapid feedback to building managers about their buildings' performance, overcoming barriers to optimal management associated with delayed feedback, see: www.buildingsalive.com



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APPENDIX A – Principles for design of behaviour change initiatives

ISF identified the following principles for design of behaviour change initiatives:

1. Identify current behaviours that are a high priority for change
2. Identify target behaviours
3. Identify systemic (i.e., technological, economic, informational, institutional, legal, social) barriers to the target behaviours and design policy options to overcome them and to support and motivate the target behaviours
4. Build a process for group support and cultural validation for households that are involved in change processes
5. Identify market segments and translate messages to resonate with these segments
6. Experiment with ways of changing social and cultural norms over the long term
7. Use diverse techniques to engage different types of people in different ways. That is, work with the different kinds of choices (routine, purchase and transitional), with approaches that engage, exemplify, encourage and enable, and with emotional and imaginative appeals as well as rational appeals.
8. Be opportunistic – take advantage of transition states and programs put in place by others.
9. Monitor and evaluate initiatives to support ongoing learning, experimentation and improvement.

Sourced from:

Riedy, C., Herriman, J., Partridge, E., Dovey, C., McGee, C., Atherton, A., and Daly, J., 2010, *Household behaviour change in Queensland: Literature review and recommendations*. Prepared for the Department of Environment and Resource Management (Queensland) on behalf of the Premier's Council on Climate Change by the Institute for Sustainable Futures, University of Technology, Sydney.



APPENDIX B – SGA Evaluation: Interview Questions

INTRODUCTION

Check if they've read the participant information sheet/ consent form

If yes, confirm consent and ask if they have any questions or would like anything clarified before starting

If no, you can use the following prompts:

Purpose of the interview

The City of Sydney has commissioned ISF to evaluate the Smart Green Apartments program. The purpose of this interview is:

- To build on the online survey findings in greater depth
- To learn from your experiences of the program and your reflections on what worked well and what could have been done differently
- To capture your insights on the most effective ways to support resource efficiency improvements in buildings
- To help inform City of Sydney's future strategy in this area

Consent

Read them the information on the consent form and then confirm consent

INTERVIEW QUESTIONS

- 1. What do you believe are the strengths of the Smart Green Apartments program?**
 - a. What worked well?
 - b. What did you like about participating in the program?
- 2. Did you encounter any difficulties in implementing the action plan recommendations?**
 - a. What were these difficulties? (Did any of these difficulties prevent you from going ahead with any of the actions?) [*refer to survey responses if relevant*]
 - b. Can you make any recommendations about how to avoid or alleviate these challenges in future?
- 3. What was it that encouraged you to implement the actions? Was there a key catalyst?**



- a. Was it easy to get all the support you needed to implement your actions? What further support might have helped improve the program?
 - b. Was it easy to use the action plan to inform the implementation process?
 - c. Did you communicate with the program managers from the City of Sydney? If so, did the communication and support provided meet your needs?
- 4. Did you take up Energy Savings Certificates as part of the program?**
- a. Was this process easy or did you find it challenging? What were the challenges?
- 5. How well did people work together to facilitate the implementation?**
- a. Were there particular barriers presented by people? (Which stakeholders? Describe the barriers)
 - b. What worked well in collaborating with other people? What didn't work?
 - c. Were there any particular partnerships, strategies or individuals that helped facilitate cooperation in your building?
 - d. Did your building's involvement in the program help foster a sense of community?
- 6. Did the experience of being involved in the program provide you with new knowledge, ideas or insights on what can be done in apartments?**
- a. How will you take/ have you taken this forward?
- 7. What do you suggest should be done to make it easier for apartment buildings to be more resource efficient?**
- a. Does the current program fill all the gaps? Is something more or altogether different required?
 - b. Have you registered for the Smart Blocks program? Do you expect that will provide the support required to implement efficiency projects?
- 8. Is there anything else you would like to say that we haven't discussed?**



APPENDIX C – SGA Evaluation: Savings Verification Questions

INTRO TEXT – TO BE INTEGRATED IN INFO SHEET SENT WITH INTERVIEW INVITATION

We'd really value your help in verifying the outcomes the Smart Green Apartments program delivered for your apartment building.

You've received this interview request due to your involvement with the *Smart Green Apartments* program, as the primary contact for your building. Its purpose is to clarify which recommendations have been or are being implemented, how savings are being monitored, and any insights on how actual outcomes align with or differ from those expected in the action plan. Knowing this will enable us to accurately assess the outcomes of the program and the implications for future initiatives in this area.

This interview should take approximately 25 minutes and all responses will be treated confidentially.

Information you provide about the improvements implemented in your building and the savings achieved may be reported, however any further information you give us about your experiences of the program will not be reported in a way that can identify you, unless we have sought and obtained your express permission. These responses will not be shared with other stakeholders in the building.

The *Smart Green Apartments* program seeks to create more efficient and cost effective apartment buildings, with a focus on energy and water efficiency and waste reduction. Its aim is to improve building performance, minimise environmental impacts and increase social connectedness around greening initiatives. This survey aims to determine outcomes in your building/s.

PROJECT IMPLEMENTATION

Which action plan recommendations have been implemented or are underway?

- Check off against action plan recommendations (spreadsheet)
- Note projects may be technology, management or behavioural focus



[If not all recommendations were taken up, or for projects that were abandoned] What prevented you from implementing more recommendations?

Follow up prompts:

- Difficulty getting executive committee approval
- Too expensive, not enough money in building funds
- Lack of understanding about technology/ products
- Unable to engage a supplier/ contractor
- Not sure what to request from suppliers/ contractors
- Lack of assistance (from strata manager, building manager..)

Did you take advantage of the Energy Savings Certificates noted in the energy report?

[yes] Did you use an accredited Certificate Provider? What was the value of the ESCs, and did this influence your decision to proceed? What was your experience of dealing with ESCs?

[no] What prevented you from doing this?

FOR EACH PROJECT:

Which stage is the project at? [e.g. planning, in progress, complete, abandoned]

- If abandoned, what led to this?
- If underway or complete, how long did it take/ do you expect it to take?

Does it align directly with the action plan recommendations, or did you make some variations?

- If variations, what were they and what led to these variations?

Capital expenditure

- Check alignment with action plan estimates

Ongoing costs (e.g. management)

- Check alignment with action plan estimates

Annual cost savings (utility bills, management, etc.)

- Check alignment with action plan estimates

Annual resource savings (electricity, gas, water, waste)

- Check alignment with action plan estimates



MONITORING AND COMMUNICATING PROJECT SAVINGS

How are savings from projects being monitored?

- What is being monitored - only \$ savings or other metrics used?
- How – bills, consumption data, other
- By whom – building manager, strata manager, executive committee, other

How is savings information being used and communicated?

- Who is it being relayed to, for what purpose?

How will you continue to monitor usage and cost savings in future? How will these be reported?

FOLLOW ON INITIATIVES

Are you planning further sustainability projects for your building?

- [If no] What has prevented you?
- [If yes] What kind of projects? Has your experience with SGA helped to enable this, and if so how?

What kind of support would enable you to implement more projects?

Prompts:

- Financial incentives
- Information
- Access to the right experts for advice
- Help with coordination and management of projects
- More support from others in the building (who?)
- Other
- (if not already addressed) who should this support come from?

Has your building registered for the Smart Blocks program?

- [no] What has prevented you so far, what would encourage you to join up? Would you like more information
- [yes] How much of the online tool did you explore? What were your impressions? Where and why did you stop?



APPENDIX D – Participant Survey



Smart Green Apartments Questionnaire

About this survey

We'd really value your feedback about your experience with the Smart Green Apartments program.

This survey has been sent to you as an apartment owner, building manager or strata manager who has participated in the Smart Green Apartments program. We'd like to know about your experiences with the program and with implementing the recommendations in your building.

This survey should take approximately 10 minutes.

Your responses will be accessible only to the UTS research team and will be treated confidentially. Information you provide about the improvements implemented in your building will be reported as part of the results of the program for your building, however any information or comments you give us about your personal experiences with the program will be reported in a way that does not identify you, unless we have sought and obtained your express permission.

Studies undertaken by the Institute for Sustainable Futures at UTS have been approved in principle by the University of Technology, Sydney, Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research you may contact ISF Research Director Emma Partridge (emma.partridge@uts.edu.au). You may also contact the UTS Ethics Committee through the Research Ethics Officer (tel: 02 9514 9615). Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

About the Smart Green Apartments program:

The Smart Green Apartments program helped to create efficient and cost effective apartment buildings that use less energy and water and create less waste. Its aim was to improve building performance, minimise environmental impacts and increase social connectedness in relation to greening initiatives.

Signing up to the program

* 1. In what capacity were you involved in the Smart Green Apartments program?

- I'm an apartment owner
- I'm a strata manager
- I'm a building manager/ caretaker
- Other (please specify)

Apartment owner

* 2. Are you..?

- An owner/ occupier (you live in your apartment)
- An owner/ investor (you lease your apartment to tenants)

* 3. Are you a member of the Strata Executive Committee?

- Yes
- No

Smart Green Apartments Questionnaire

Member of the Strata executive committee

* 4. What is your role on the Executive Committee?

- Chairperson
- Secretary
- Treasurer
- Other (please specify)

General questions

* 5. What is the name of your building?

* 6. What motivated you to join the Smart Green Apartments program?

Tick up to 4 of the most important motivators that apply to you.

- | | |
|--|---|
| <input type="checkbox"/> Demand from others in the building | <input type="checkbox"/> Improving my knowledge of energy efficiency/ sustainability |
| <input type="checkbox"/> Improving the building's value | <input type="checkbox"/> Improving community spirit in the building |
| <input type="checkbox"/> Reducing the building's operating costs | <input type="checkbox"/> Expanding my professional skill set as a building or strata manager |
| <input type="checkbox"/> Reducing the building's environmental impact | <input type="checkbox"/> Gaining a marketing edge for my business as a building or strata manager |
| <input type="checkbox"/> Access to free expert advice (audits and action plan) | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Direction and support from Council | |
| <input type="checkbox"/> Other motivators (please specify below) | |

* 7. Were there any barriers to joining the Smart Green Apartments program?

Tick up to 4 of the most significant barriers for you.

- | | |
|--|--|
| <input type="checkbox"/> Lack of information about the program | <input type="checkbox"/> Getting owners on board |
| <input type="checkbox"/> Unsure about what my commitment would involve | <input type="checkbox"/> Getting the strata manager on board |
| <input type="checkbox"/> Unsure about the benefits of the program | <input type="checkbox"/> Getting the building manager on board |
| <input type="checkbox"/> Finding the time to sign up and/ or be involved | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Not knowing how or where to start | |
| <input type="checkbox"/> Other barriers (please specify below) | |

Smart Green Apartments Questionnaire

Implementing projects

* 8. What recommendations were implemented in your building (or are in progress)?

Tick all that apply.

- | | |
|---|--|
| <input type="checkbox"/> Lighting improvements | <input type="checkbox"/> Energy sub metering |
| <input type="checkbox"/> Air conditioning improvements | <input type="checkbox"/> Water sub metering |
| <input type="checkbox"/> Improvements to hot water system | <input type="checkbox"/> Power factor correction |
| <input type="checkbox"/> Improvements to pool/spa equipment | <input type="checkbox"/> Water efficiency projects |
| <input type="checkbox"/> Improvements to car park ventilation | <input type="checkbox"/> Waste reduction projects |
| <input type="checkbox"/> Solar photovoltaic (PV) system | <input type="checkbox"/> Don't know |
| <input type="checkbox"/> Other (please specify below) | |

* 9. What motivated you to implement the recommendations from your action plan, or support the implementation of these actions?

Tick up to 4 of the most important motivators for you.

- | | |
|--|---|
| <input type="checkbox"/> Low capital cost | <input type="checkbox"/> Strong support from Owners Corporation |
| <input type="checkbox"/> Short payback period (ie. upfront costs soon paid off by savings) | <input type="checkbox"/> Leadership within Strata Executive Committee |
| <input type="checkbox"/> Significant ongoing cost savings | <input type="checkbox"/> Implementation support provided by Council |
| <input type="checkbox"/> Easy to implement | <input type="checkbox"/> Opportunity to improve my knowledge and skills |
| <input type="checkbox"/> Improvements to building value | <input type="checkbox"/> Opportunity to build community spirit in the block |
| <input type="checkbox"/> Environmental benefits | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Other (please specify below) | |

Smart Green Apartments Questionnaire

* 10. For any recommendations that were NOT pursued (or were started and then abandoned), what were the main reasons that prevented them going ahead? Tick up to 4 reasons.

- | | |
|--|---|
| <input type="checkbox"/> Not applicable - all the recommendations went ahead | <input type="checkbox"/> Lack of understanding about recommended technology/ products |
| <input type="checkbox"/> Unable to get approval from Owners Corporation | <input type="checkbox"/> Not sure what to request from suppliers/ contractors |
| <input type="checkbox"/> Unable to get Executive Committee support | <input type="checkbox"/> Unable to engage a supplier with the right products |
| <input type="checkbox"/> Too expensive and/or not enough money in building funds | <input type="checkbox"/> Unable to engage a contractor with the necessary skills |
| <input type="checkbox"/> Long payback period | <input type="checkbox"/> Lack of assistance from building manager |
| <input type="checkbox"/> Insufficient cost savings identified in the action plan | <input type="checkbox"/> Lack of assistance from strata manager |
| <input type="checkbox"/> Not knowing how or where to start | <input type="checkbox"/> Lack of assistance from Council |
| <input type="checkbox"/> Other (please specify below) | |

* 11. For those recommendations that WERE implemented in your building, were any problems or barriers experienced?

Tick up to 4 barriers.

- | | |
|--|---|
| <input type="checkbox"/> Not applicable – there were no problems or barriers | <input type="checkbox"/> Difficulty finding the right contractors or products |
| <input type="checkbox"/> Upfront cost was more than expected | <input type="checkbox"/> Lack of assistance from apartment owners |
| <input type="checkbox"/> Time commitments were significant | <input type="checkbox"/> Lack of assistance from building manager |
| <input type="checkbox"/> Unexpected complications with project | <input type="checkbox"/> Lack of assistance from strata manager |
| <input type="checkbox"/> Lack of an active 'champion' to drive the project | <input type="checkbox"/> Lack of assistance from Council |
| <input type="checkbox"/> Other (please specify below) | |

* 12. On average, how satisfied are you with the outcomes of the recommendations that have already been implemented in your building?

Very unsatisfied	Unsatisfied	Neutral	Satisfied	Very satisfied	Don't know
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. (Optional) What are your main reasons for this?

Smart Green Apartments Questionnaire

* 14. Did any of the following factors have a positive influence on the outcomes of projects in your building?

Tick up to 4 of the most influential.

- | | |
|---|---|
| <input type="checkbox"/> An active 'champion' to drive and/or coordinate the project | <input type="checkbox"/> Active cooperation and involvement of the building manager |
| <input type="checkbox"/> Access to free expert advice | <input type="checkbox"/> Positive partnerships with external stakeholders |
| <input type="checkbox"/> Having clear recommendations and costs outlined in the action plan | <input type="checkbox"/> Independent expert presenting at the AGM |
| <input type="checkbox"/> Agreement amongst apartment owners | <input type="checkbox"/> Direction and support from Council |
| <input type="checkbox"/> Active cooperation and involvement of apartment owners | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Other (please specify below) | |

* 15. If your project had a 'champion' (that is you or someone else who was the main driving force behind making it happen), what role was this person in?

(If no particular champion, tick 'not applicable')

- Strata executive committee member
- Owners corporation member
- Building manager
- Strata manager
- Not applicable (no particular champion)
- Other (please specify)

16. (Optional) Please describe any specific ways that this 'champion' contributed to the project's success.

* 17. Did you personally play a central role in implementing and overseeing projects in your building?

- Yes
- No

More on Implementation

Smart Green Apartments Questionnaire

* 18. Did you take advantage of the Energy Savings Certificates (ESCs) noted in the energy report?

Yes

No

More on Implementation

* 19. Did the value of ESCs influence your decision to proceed?

Yes

No

* 20. Did you use an accredited Certificate Provider?

Yes

No

More on Implementation

* 21. What were the main factors that prevented you from taking advantage of the Energy Savings Certificates?

* 22. Are savings from projects being monitored?

Don't know

No

Yes via utility bills

Yes via other method:

More on Implementation

Smart Green Apartments Questionnaire

* 23. What savings are being monitored?

Tick all that apply

- Cost (\$)
- Electricity (MWh)
- Gas (GJ)
- Water (kL)

* 24. Who is responsible for monitoring savings?

- Executive Committee
- Building Manager
- Strata Manager
- Other

25. (Optional) How is savings information being used and communicated?

More on Implementation

* 26. Has your building registered for the Smart Blocks program?

- Yes
- No
- Don't know

More on Implementation

27. (Optional) What would encourage you to join the Smart Blocks program?

More on Implementation

28. (Optional) What were your impressions of the Smart Blocks website?

Reflecting on the program outcomes

Smart Green Apartments Questionnaire

* 29. Has your involvement in the Smart Green Apartments program improved your understanding of environmental performance issues in apartment buildings?

Yes

No

Comments

* 30. Has this experience made you more likely to implement further environmental improvements to your building, or other buildings?

Yes, future projects are already being planned

Yes, but no firm plans yet

No

Unsure

Comments

31. (Optional) What (if anything) would encourage you to make further environmental improvements to your building?

32. (Optional) Do you have any other comments about the benefits of the program, or suggestions for what could have been done better?

33. One of our researchers may wish to contact you to request a brief, confidential telephone interview to expand on these topics.

If you are willing to participate please provide your preferred contact. If you do NOT wish to be contacted, please tick the box below.

Do not contact

Reflecting on the program outcomes

Smart Green Apartments Questionnaire

* 34. Name and best email or phone contact

Name:

Email Address:

Phone Number:

End of survey

Thank you for participating in this survey, your input is greatly appreciated and will help to evaluate the Smart Green Apartments program and inform City of Sydney's future work in this area.

