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ResourceSmart Schools Evaluation

Report prepared for Sustainability Victoria

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Key findings

- The ResourceSmart Schools framework (RSS) has made a positive contribution to reducing the resource use of participating schools.
- Participating schools would not have the information, resources and wherewithal without the program to achieve like savings in resources.
- The level of resource savings has been substantive. We estimate that the current initiative (which is funded from 2011/12 to 2014/15) has contributed to reduced school expenditures on resources (such as electricity and water) and waste in the order of \$12.6 million (in present value terms).
- The program has delivered net positive economic benefits with the value of resource saving exceeding the costs of delivery.
- There is merit in continuing the RSS framework and focus should shift to attracting secondary schools' participation and clearer separation of program expenditure allocated to investments in resource saving and expenditure that is allocated toward broader educational objectives.
- There are opportunities to improve the efficiency of the program by better integrating data captured by complementary programs, Department of Education and Early Childhood Development resource use data and billing and new remote utility metering technologies.
- There are also opportunities to increase contestability of auditing and enabling savings from accredited saving technologies to be recognised on an ongoing basis without the need for school use data.

Executive summary

The RSS program is nearing the completion of the 2011/12 to 2014/15 funding cycle. This report evaluates the outcomes of the program over the period against lapsing funding evaluation guidelines.

We estimate that approximately 825 schools have participated in the program over the period 2011/12 to 2014/15, including 425 new schools. The RSS program has two key objectives for these schools:

- reducing resource use; and
- ensuring sustainability education is available to all students.

We assessed the changes in resource use across the schools drawing on a range of data and weighed the value of those savings against the costs of delivery. We undertook and assessed the scale and scope of change in education outcomes based on a range of qualitative and empirical data from previous evaluations.

There are a range of factors that cause schools to use more resources than is desirable. In the absence of intervention through this program, these factors are significant impediments to resource saving investment and practice change.

The outcomes from the RSS program hinge on educational resource modules to engage students in sustainability education and associated practice change and grants (to fund the identification of and investment in resource saving technologies and teacher training to build capacity to deliver on sustainability objectives). Combined the grants and the modules are the resources for schools to improve infrastructure, drive practice change and improve education outcomes.

Between 2011/12 and 2014/15 the RSS program costs \$12.2 million (in present value terms) to deliver and this has yielded aggregate benefits to schools and the wider the community in the order of \$12.6 million. The majority of the expenditure of the program was on resource grants funding and facilitation of the framework into schools. The resource grants funding was expended reasonably evenly across a mix of infrastructure, resource audits and teacher training. We note there are number caveats to the estimations made in this evaluation including:

- the estimates are based on a limited sample of school resource savings; and
- the likely counterfactual behaviour of schools is difficult to predict.

Schools are required to record resource consumption and billing data and monitor changes in resource use. However, the success of this data recording has been mixed due to a variety of reasons. There are opportunities to reduce the requirements on schools wishing simply to make resource savings and there are opportunities to expand the program to schools wishing to make this their sole or core focus of program participation. Nonetheless, education outcomes are an important focus for many schools with the resource modules a key vehicle to drive resource savings practice change and this practice change should continue to be part of the any future program.

1. Introduction

1.1 Purpose of the evaluation

Current funding (2011/12- 2014/15) of ResourceSmart Schools (RSS), formerly ResourceSmart AuSSI Vic, is nearing completion and it is timely to assess the public value that has been achieved by expenditures on the program.

The purpose of this evaluation is to assess the performance and impact of the RSS and provide an evidence base to inform Government decision making around the lapsing program.

In this evaluation we assess the program against the Victoria Department of Treasury and Finance lapsing funding evaluation guidelines that provide Sustainability Victoria with an opportunity to

- articulate the nature of the program that has been delivered;
- communicate the performance and impact of the program; and
- seek support for the necessary actions that arise from the evaluation.

1.1.1 ResourceSmart Schools overview

The RSS is Victoria's approach to the Australian Sustainable Schools Initiative (AuSSI). In particular, AuSSI website notes that AuSSI:

... is a partnership of the Australian Government and the states and territories that seeks to support schools and their communities to become sustainable.

... engages participants in a whole-of-school approach, to explore through real-life learning experiences, improvements in a school's management of resources and facilities including energy, waste, water, biodiversity, landscape design, products and materials. It also addresses associated social and financial issues.

Key activities of RSS have been:

- **extending the reach.** Extending ResourceSmart School's reach, embedding education for sustainability into an additional 425 schools and nine early childhood centres (these participated in a pilot program under the current initiative);
- **funding for existing participants.** Continuing to provide support to schools already participating in ResourceSmart Schools; and
- **energy efficiency grants.** Providing Education Facility Energy Efficiency Grants – incentive grants of up to \$10,000 for new schools and early childhood centres to undertake energy audits and contribute to the purchase of energy efficient or sustainable infrastructure.

RSS evolved from an earlier pilot that commenced in 2003. The program also builds on a variety of other sustainable infrastructure and behaviour change programs for schools including:

- Victorian Solar in Schools — a grants program to encourage the installation of solar power in schools. We understand that only a small number of RSS school have installed solar panels¹; and
- DEECD Schools Water Efficiency Program (SWEP) — automated meter reading installation and web based daily consumption assessment tools.

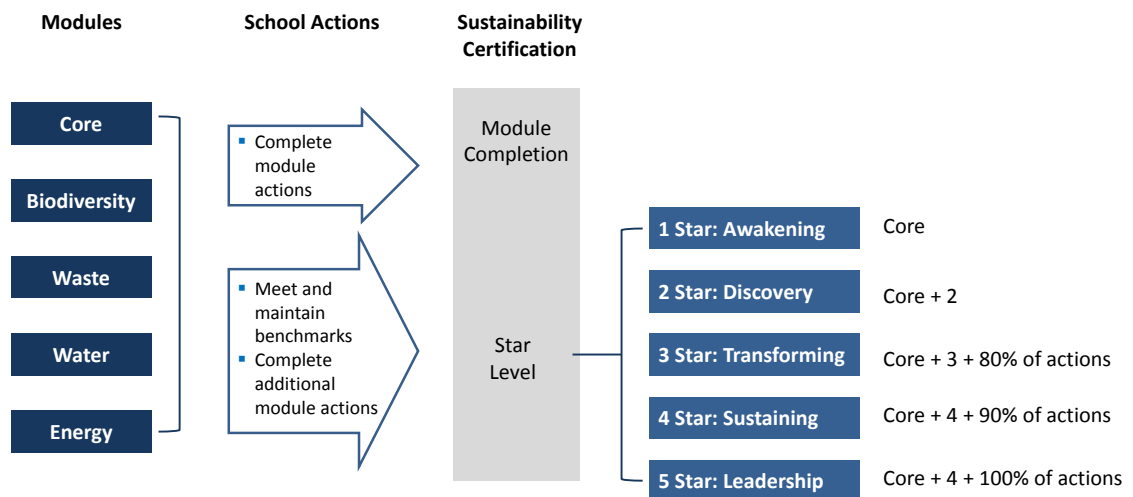
In 2011, the Victorian Government committed \$8.305 million over four years to build on the existing RSS framework².

RSS allows schools to be certified based on their performance in completing modules as well as meeting and maintaining benchmarks. There are five modules, with the core module being the first one to be completed (Figure 1). Sustainability Certification consists of either recognition for completing modules or star progression (Figure 1). The benchmarks that are required to be met and maintained to achieve particular star progressions (1 to 5) are outlined in Figure 1, noting that stars are valid for three years. Generally schools are required to show a reduction in resource use to meet a benchmark (some schools can be very resource efficient in some areas when they enter the program and as a result can more easily achieve the benchmark). Schools can elect to work toward aspirational targets beyond the benchmark.

These targets encourage schools to go beyond average performance and demonstrate true leadership.

The Sustainability Victoria website, ResourceSmart Online, includes an inbuilt Sustainability Certification system. As schools register their completed actions, the system tracks their progress until they reach completion of modules and stars.

Figure 1: Completing modules and certification process



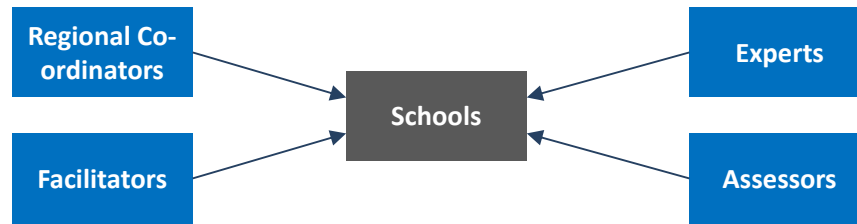
Note: Module descriptions and benchmarks are provided in Appendix 1

RSS has a network of regional sustainability experts to support schools in undertaking modules and actions (Figure 2).

¹ We note that in the 2013/14 Sustainability Victoria progress survey around 8 per cent of schools that are new to the program (post 2011/12) indicated that they had installed solar panels. However, it is not clear whether this relates to investment prior to entering the RSS program or the proportion of total energy needs for the school that this serves.

² Sourced from Sustainability Victoria.

Figure 2: Regional consortia



1.2 Approach and objective of the evaluation

The key objective of this evaluation is to assess the performance and impact of RSS and to assess the merit of renewing funding for the program.

In undertaking this evaluation we have considered a range of information provided by Sustainability Victoria, including previous reports and evaluations. Of particular note is the recent research report by Monash University³.

We have also consulted directly with:

- different staff members within Sustainability Victoria that are involved in managing the program;
- WSP Digital, which is the organisation that has developed the resource reporting technology; and
- the Department of Education and Early Childhood Development (DEECD). The discussions with DEECD were focused around the energy grants program, which is administered by DEECD, and their collection of energy use data.

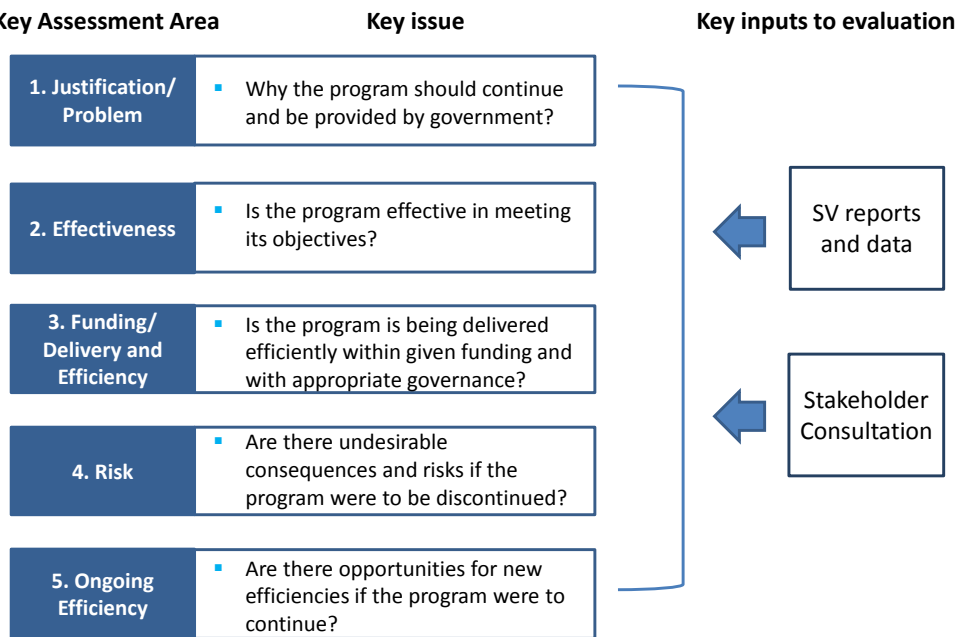
Our method outlined in Figure 3 is consistent with the Department of Treasury and Finance's (DTF) 'Evaluation policy and standards for lapsing programs' (2013). To assess ex post performance and impact, we considered for RSS over the evaluation period:

- have there been sound reasons for government to provide the program? — establishing that there has been strong public policy rationale for government participation and that there is a continued need for the program;
- has the program delivered the outcomes that were sought? — we identify consequences of the program and the alignment of those consequences with the project objectives.
- has RSS achieved the outcomes efficiently and effectively? — we assess the relative resources that have been required to achieve the outcomes and the quality (e.g. targeted timeliness) with which they have been brought bear; and
- broadly, have the benefits of the outcomes outweighed the costs of achieving them? — we consider the likely order of magnitude of the direct benefits of the program and weigh them against the direct costs. We note a broader benefit costs test, where a wider range of indirect and intangible costs and benefits are assessed (e.g. learning outcomes for students), is not undertaken and is beyond the scope of this evaluation.

³ Monash University (2014), ResourceSmart Schools Research Project Final Report, Report commissioned by Sustainability Victoria.

To consider the merit of continuing funding of the lapsing program, we also undertake an ex-ante assessment of these questions beyond 2014.

Figure 3: Evaluation method



1.3 Program objectives and basis of evaluation

The original funding bid to the Department of Treasury and Finance (prior to 2012) outlined two key objectives of the program:

- Objective 1: assist schools and early childhood facilities to reduce their environmental impacts by reducing energy consumption, water consumption and/or waste production, and increasing biodiversity in school areas, as well as saving money through reduced energy and water bills; and
- Objective 2: ensure that education for sustainability is available to students at all education levels.

The original funding bid also contained a specific target for the first objective which was to increase the program reach to an additional 400 schools and early childhood centres. The original funding bid also assumes that existing program participants will continue and need to be serviced by RSS.

In this evaluation we focus primarily on estimating the costs and benefits associated with outcome 1 and synthesise insights of previous evaluations for outcome 2. We do so as the resource savings component of the program accounts for the vast majority of program expenditure and previous evaluations have assessed education outcomes. The resource modules, apart from building a sustainability curriculum, also contribute to resource savings. Moreover, the modules assist students with resource use audits and practice change.

1.4 Data

In this evaluation we used existing Sustainability Victoria reports and data. As part of RSS, SV developed and maintains a web portal (ResourceSmart Schools Online) that enables participating schools to:

- access program information;
- undertake curriculum modules to support the education component of the program; and
- record resource savings that have been achieved through RSS investments.

Participating schools can report on a monthly, quarterly or annual basis their resources savings for:

- electricity— estimated as reductions in electricity bills measured quarterly or yearly and reported as average monthly savings;
- gas—estimated as reductions in gas bills measured quarterly or yearly and reported as average monthly savings;
- water—estimated as reductions in water bills measured quarterly or yearly and reported as average monthly savings; and
- waste – estimated as reductions in recycling bin removal bills and reductions in resource use of materials such as paper measured quarterly or yearly and reported as average monthly savings.

Schools also estimate changes in their contribution to biodiversity according to a valuation methodology established by the program.

We note that there are a number of serious limitations to using ResourceSmart Schools Online data for this program evaluation. In particular, the database is generated by self-reporting of resource use billing (utility bills and waste pickup costs). For many schools data entry into database has been sporadic and inaccurate. There are a variety of reasons for this:

- recording is voluntary, taking time and effort to enter into the database;
- billing data is held by administrators and financial controllers and is often not readily accessible to student and teachers responsible for updating the database; and
- in any database recording period, billing data can include multiple charges and non-consumptive charges such as connections, rebate credits and adjustments

These limitations mean that database is not robust enough to directly estimate reported savings using a census of the database. Instead, we undertook a sample of subsets of the database to calculate a statistically significant estimate of resource savings. We also supplement the ResourceSmart Online database with schools energy consumption data that is gathered and analysed by the Department of Education and Early Childhood Development. We note later in the report opportunities to improve the accuracy and usefulness of ResourceSmart Online.

1.5 Structure of this report

The structure of the remainder of this report is:

- section 2 — reviews the program logic and assesses the justification for the program;
- section 3 — assesses the effectiveness of RSS;

- section 4 — assesses funding delivery and efficiency;
- section 5— considers risks of ceasing RSS and ways of mitigating the risks; and
- section 6 — sets out conclusions and recommendations.

Supporting documentation is in appendix 1.

2. Program justification

In this section we consider the evidence for the need for the program — assessing the rationale for government to provide grants to schools to undertake audits and contribute to the purchase of resource saving infrastructure, as well as providing schools with tools and information on how to make changes to resource and waste management practices.

2.1 Rationale for government intervention

The cost of energy, water and waste from Victorian schools is significant. There can be overall benefits to the community when the benefits from resource savings outweigh the costs of achieving them:

- reducing the costs of resource use can result in lower operating costs of schools and thereby reduce the costs of provision to tax payers and fee paying parents and guardians;
- savings in resource use can be redirected toward achieving better education outcomes; and
- lowering resource use can reduce spill-overs (unpriced environmental outcomes on the community such as the creation of carbon dioxide emissions, pollution and loss of biodiversity).

In a competitive market where the resource user directly bears the costs of resource use and the costs of more efficient technology, sensible business choices can be made to invest in more resource efficient infrastructure without government intervention.

In addition, where the effects of resource use on third parties is fully priced, such as through an appropriately design carbon mitigation scheme, there are fewer rationales for governments to encourage lower resource use.

In general, resource use in Victorian schools does not demonstrate the characteristics of an optimal market — where prices and incentives drive efficient outcomes and where choices and consequences are transparent and appropriately borne. Instead, schools resource use exhibits a number of ‘market failures’ creating under-investment in sustainable schools infrastructure and spill-over effects on to third parties. Key market failures are:

- **Public goods** — benefits of the sustainability action cannot be captured solely by the school or business targeted by the program;
- **Externalities** — actions and decisions of schools and businesses targeted by the program will affect sustainability outcomes of others elsewhere;
- **Information asymmetries** — schools and businesses targeted by the program do not have the same information that is available to others making sustainability decisions.

2.1.1 Public goods.

Resource use is generally non-excludable (individuals cannot be excluded from using the resource) and non-rival (consumption by one individual does not diminish consumption by another). These characteristics create incentives for over use.

Resource use can be a collective action problem - there is often an individual incentive problem to minimise resource use – the students and teachers that are the users of energy and resources are not aware of the costs and do not directly bear the costs of their resource use decisions. These costs are passed on to other parties and distributed across all resource users. Personal consumption is not transparent as resource users do not directly pay for marginal changes in energy and resource use.

Often there is not accountability for key resource use decisions, such as: the timing of use; the quantity of use; the length of use; and turning off equipment not in use. Some infrastructure initiatives are passive in that they do not require practice change by the school body – such as rainwater tanks for gardens, LED lighting, automatic light switches and double glazing and more efficient air conditioning – others require choice to be made and actions to be undertaken – such as waste paper recycling practices, turning off lighting and air conditioning.

This problem of accountability for resource use is exacerbated by the use of school resources by the general public. Many schools provide school facilities to the general public out of school hours. In recent years, the Building Education Revolution (in response to the Global Financial Crisis) gifted new building facilities to schools on the undertaking they also be available for wider community use. In some schools this has resulted in step change increases in resource consumption. This can create externalities to the school.

The RSS framework provides education and learning resources, and grants to address market failure problems associated with collective action problems that result in high resource use. Embedding passive resource saving technologies, for example, reduces the need for individual or collective action to achieved savings.

2.1.2 Externalities

Resource use of schools has spill-over effects. Electricity use results in carbon dioxide emissions that contribute to climate change. Waste from schools can contribute to pollution through land fill. The land-use of schools can reduce biodiversity. All of these outcomes are un-priced on the community and lead to over-consumption of resources and higher than optimal waste levels.

2.1.3 Information asymmetries

In general, resource users (student and teachers) are unaware of the costs of their resource use choices. There is often a limited understanding of personal and group choices and how they affect resource use. Resource costs are generally not well understood by the members of the school. For example, an important component of the program is the use of grants to undertake energy audits. Audits help address the information asymmetry by increasing student and teacher knowledge about levels of resource use and where potential savings might be most easily achieved at lowest cost.

Education modules in the program attempt to address information asymmetry problems by increasing awareness of the impact of personal choice and the consequences of decisions. Introducing sustainability education can help to highlight the source of the externality and

public good problems with energy use. Previous evaluations by Monash University⁴ and Corbett Consulting⁵ suggest that the education modules can help build awareness among students and teachers and increase engagement and participation in the resource saving initiatives.

2.1.4 Government also contributes to inefficient outcomes

Government arrangements can also contribute to poor resource use in schools. While Government collects energy consumption and bill data, schools have limited access to information to:

- compare their electricity use to like schools; and
- understand their utility tariff structures and identify ways to reduce consumption.

2.2 What problems are being addressed through the program?

While the market failures are not insurmountable in themselves, they can take time, effort and money to find technology solutions and purchase and implement them. The transaction costs for individual schools to seek out and implement solutions can outweigh the direct benefits to them of doing so. RSS addresses some of these issues by:

- developing common resource audit methods to reduce the costs of identifying resource source savings;
- funding grants to invest in technologies and practice changes; and
- developing common information packages that provide the educational tools and resources for teachers to reduce the costs of practice change.

2.3 Other programs

Over some or all of the period of evaluation (2011/12 to 2014/15), resources to improve sustainability outcomes in schools can be found in a variety of other programs. These include Victorian and Australian government programs, that are similar to RSS and tend to complement rather than crowd out RSS, and programs run by non-state government entities with components that duplicate aspects of RSS.

Complementary Victorian and government programs include:

- SWEP (Schools Water Efficiency Program) — A DEECD and DEPI initiative which has 511 participating schools. The program centres on schools purchasing an automatic water meter reader that monitors daily water use and sends consumption data to the school via an automated web portal. Schools also participate in web based water efficiency learning tools that can be incorporated into the school curriculum.
- Landcare –a long running landholder and community program focussed on managing local environmental issues and has engaged with some individual schools.

Other like programs include:

⁴ Monash University (2014), ResourceSmart Schools Research Project Final Report, Report commissioned by Sustainability Victoria.

⁵ Lea Corbett Consulting (2010), Evaluation of ResourceSmart AuSSI Vic, Report for Sustainability Victoria.

- Learning for Sustainability — The Yarra Ranges Shire initiative available to schools in the local government area. The initiative has 84 participating schools; and
- Other sustainability education resources such as those from geography and environmental science curricula and the Gould League.

While RSS is the primary vehicle for schools to be involved in integrated environmental curriculum, some individual schools have developed their own approach to sustainability action by developing their own teaching resources. They have done this by drawing on components of programs and initiatives from a range of sources. For example, Corbett (2010) observed that for a small sample of schools not participating in the RSS:

All six schools were teaching and learning about sustainability through other avenues and approaches. For example, many had attracted grants to install water tanks or establish kitchen garden beds, and were recycling paper, composting and/or involved in local tree planting activities. Teachers were drawing support from local councils, water authorities, local landcare groups, web searches or wherever they could. Other schools had charted their own course in terms of integrating sustainability into the curriculum using, for example, the UNESCO model of sustainability as their guiding framework.... For example, 84 schools in the outer eastern suburbs of Melbourne are involved in the “Learning for Sustainability” program run by the Shire of Yarra Ranges.⁶

Additionally, some wider community programs address some market failures associated with resource use and waste in schools. For example:

- new building code standards such as minimum insulation ratings, low flow water fittings, dual flush toilets, low wattage light fittings and so forth contribute to lower resource use;
- the introduction of the Australian Government Direct Action Plan for Climate Change; and
- the introduction of national lighting standards (that began taking effect in 2012 with phase-in complete by 2014) requiring lights to be 25 per cent more energy efficient and will result in cessation of retailing of most incandescent globes. We understand that RSS audits have commonly recommended a switch to energy efficient lighting and represent around 20 per cent proportion of expenditure of grant expenditure⁷. Arguably, a major benefit of RSS has been to bring forward in time the energy savings from more efficient lighting.

While these programs broadly attempt to address common market failure associated with inefficient resource use, they do not specifically target the underlying market failure characteristics that are specific to schools. Moreover, they do not link incentive and subsidy programs to educational curricula to also focus on practice change within the school community.

2.4 Conclusion - is there a need for the program?

RSS addresses a number of substantive market failures. While there are a number of complementary programs and one competing program (in the Yarra Ranges Shire) it is unlikely

⁶ Lea Corbett Consulting (2010), Evaluation of ResourceSmart AuSSI Vic, Report for Sustainability Victoria, page 38.

⁷ This is based on verbal discussions with the staff that operate the grants program and funding applications within the Department of Education and Early Childhood Development.

that these programs would provide the wherewithal to address the observed market failures in section 2. Therefore, in the absence of the program there would be an underinvestment in resource saving infrastructure, as well as teaching and learning for sustainability in schools.

3. Program effectiveness

This section provides evidence of the effectiveness of the program by assessing outcomes against the program logic and undertaking a high level benefit cost analysis.

3.1 Assessment of whether the objectives have been met

We have assessed whether RSS has met its original two key objectives. This is outlined below.

3.1.1 Objective 1: Reducing environmental impacts

There is a range of evidence that shows that RSS has reduced environmental impacts:

- **There have been environmental changes in schools.** Over the period of the RSS program (2011/12 to 2014/15); the participating schools have, on average, reduced energy consumption, water consumption and waste production and increased biodiversity in school areas. This is based on data reported by participating schools.
- **Many of these changes have occurred because of RSS.** There is evidence from a range of sources that the changes have occurred directly because the schools participated in RSS; and
- **RSS has extended its reach.** RSS has exceeded its target of extending the program to an additional 400 additional schools by 2015, reaching an additional 425 schools.

These results are discussed in more detail below.

Environmental changes in schools

Our analysis of data provided by Sustainability Victoria indicates that schools have typically gained a reduction between 5 and 10 per cent per annum depending on the resource/waste type (Table 6). We are of the view that this benefit is likely to last for 5 years on average for each school, noting that there is some uncertainty over this length. We have assumed 5 years given that many of the changes involve new infrastructure (e.g. retrofitting of lights) which would not otherwise be undertaken by schools and because many of the participating schools have indicated that RSS was a significant driver of change (more information on this can be found in section 3.1.2).

Further analysis of the resource and waste benefits, including their value, is discussed in section 3.2.3. Additionally, we have undertaken sensitivity analysis of the length of time for which the benefits last in section 3.2.5.

Many changes in schools have occurred because of RSS

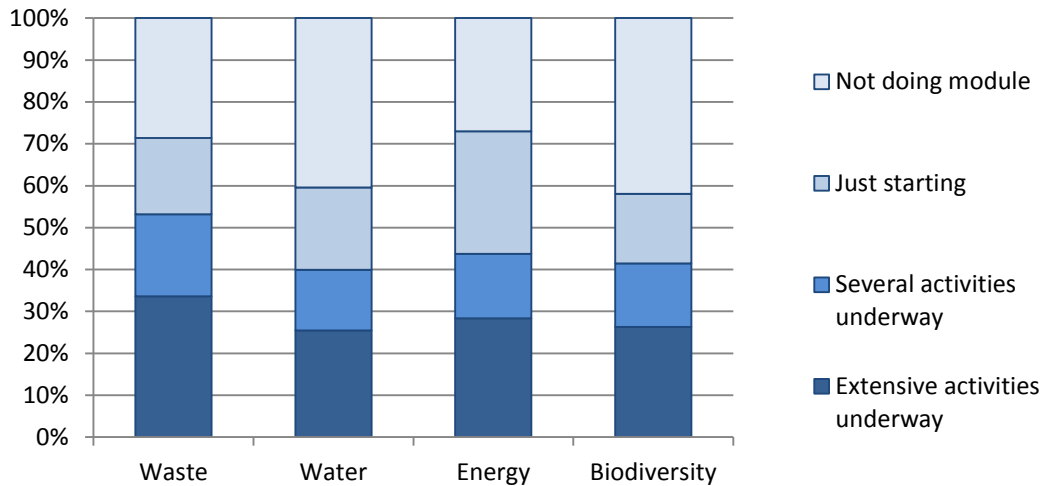
For many schools RSS has led to changes in school infrastructure and/or practice changes. For those schools participating in RSS, more than half of schools have had some involvement in each of the framework's modules⁸ (Figure 4). Moreover, on average across all modules (waste,

⁸ Some involvement includes 'just starting', 'several activities underway' and 'extensive activities underway'.

water, energy and biodiversity), 46 per cent of schools surveyed indicated that they have either ‘several activities underway’ or ‘extensive activities underway’.

Additionally, if we exclude the ‘just starting’ category, it appears that schools have undertaken the most activities in waste-related activities. However, there appears to be a higher recent priority placed on energy-related activities with 31 per cent of schools surveyed indicating they are ‘just starting’ this module.

Figure 4: Level of activity in resource areas



Source: Sustainability Victoria RSS progress survey (2013/2014).

Notes:

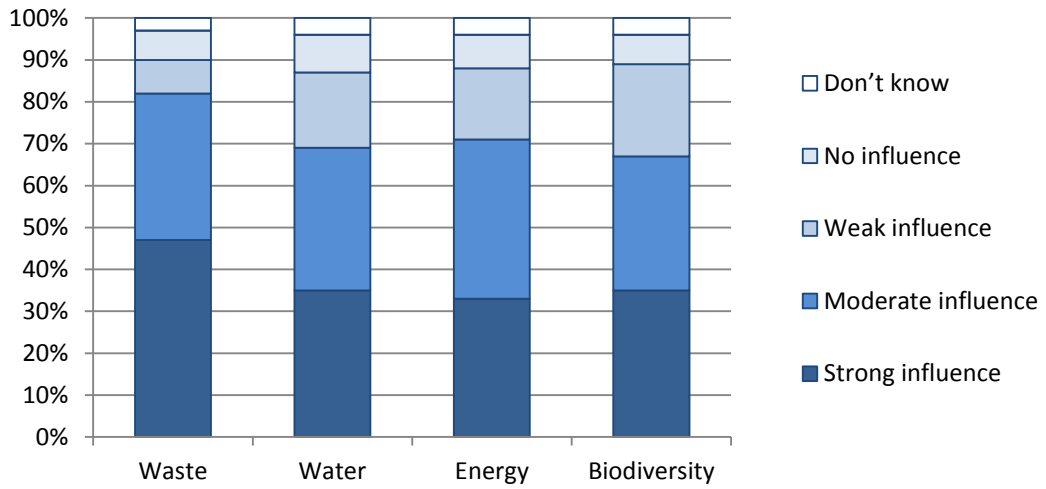
1. The numbers of survey responses that are used in this graph for each resource area are: waste (208), water (174), energy (180) and biodiversity (183). The reason these totals do not match is that some respondents did not provide an indication of their level of activity for each resource.
2. The survey data that we have used only includes the latest survey for a school where they may have undertaken several surveys over the period 2013 and 2014.
3. Note that more than 90 per cent of schools in the survey indicated for the core module that their involvement can be defined as ‘just starting’, ‘several activities underway’ or ‘extensive activities underway’.

The involvement of schools in RSS appears to be effective in influencing changes. In the Sustainability Victoria’s 2013/2014 progress survey, more than 80 per cent of schools believe that being involved in the program has directly led to a reduction in the amount of resources used in their schools⁹. Moreover, 51 per cent of schools surveyed believe that this reduction is ‘often’ or ‘yes, definitely’.

Additionally, RSS has been effective in influencing schools to make changes to school facilities (‘campus improvements’). In particular, a recent survey by Monash University showed that more than 60 per cent of school survey participants stated that each of the resource modules were a ‘moderate’ or ‘strong’ influence in making campus improvements (Figure 5). Schools surveyed believed that the influence has been particularly strong in waste related activities.

⁹ This includes those that responded ‘a little’, ‘often’ and ‘yes, definitely’. Note that 18 per cent stated that there had not been a reduction in resource use. Of this 17 per cent, 40 per cent indicated they were ‘just starting’ RSS.

Figure 5: Influence of the program on school campus improvements



Source: Monash University (2014), ResourceSmart Schools Research Project Final Report, Report commissioned by Sustainability Victoria, page 11. The survey question was ‘Since joining RSS, how strong an influence has the program actually had on the following elements of sustainability within your school?’ The number of survey respondents was 160.

In undertaking these modules, schools have implemented specific initiatives that have resulted in changes to school facilities. To illustrate this, Table 1 provides some examples of the types of activities undertaken by schools with some useful quotes from the schools.

Table 1: Examples of school initiatives

Resource area	Examples of specific initiatives undertaken by schools	Quotes from schools
Waste	<ul style="list-style-type: none"> Waste free lunch days Recycling paper and flexible plastic products Online publication and communication 	<p><i>'First step was recycling and a policy for sustainable buying e.g. controls for rubbish, as lots of paper wasted'.</i> [Government Primary School]</p>
Water	<ul style="list-style-type: none"> Installation of water tanks for toilets and dual flush toilets Use of storm water to flush toilets and water gardens Buckets under drink taps 	<p><i>'the school went from being reliant on normal sources of water to having a water tank installed, flushing the toilets with this water, and making significant savings in water use'.</i> [Government Primary School]</p>
Energy	<ul style="list-style-type: none"> Installation of solar panels Appointing school 'Power Rangers' to ensure lights not being used are off Installation of energy efficient lighting 	<p><i>'The system is great, you can track how you're going for 5/6 years – if the bill spikes you can address the issue'.</i> [Catholic Primary School]</p>
Biodiversity	<ul style="list-style-type: none"> Revegetation of school grounds Planting indigenous trees Creation of vegetable patches and frog bogs 	<p><i>'For biodiversity we established the garden. People are much more receptive to this as it's very tangible and people like gardening'.</i> [Government Primary School]</p>

Source: Examples of specific initiatives were sourced from the Sustainability Victoria RSS progress survey (2013/14). The quotes were sourced from Monash University (2014), ResourceSmart Schools Research Project Final Report, Report commissioned by Sustainability Victoria, pages 11-14.

RSS has assisted schools to undertake these modules and implement changes in a variety of ways. A recent study by Monash University¹⁰ highlighted five key aspects of the program that were influential in supporting schools to make changes (Table 2).

Table 2: Key aspects of RSS program that help schools make changes

Key aspect of program	How aspect influences schools
Structured frameworks	<p>The framework helps by providing schools with a focus – a guide as to where to start, what to focus on and what to do next.</p> <p><i>'AuSSI Vic gives us the nitty gritty – an in-depth framework for addressing sustainability.'</i> [Government Primary School]</p>

¹⁰ Monash University (2014), ResourceSmart Schools Research Project Final Report, Report commissioned by Sustainability Victoria, Figure 1 page 30.

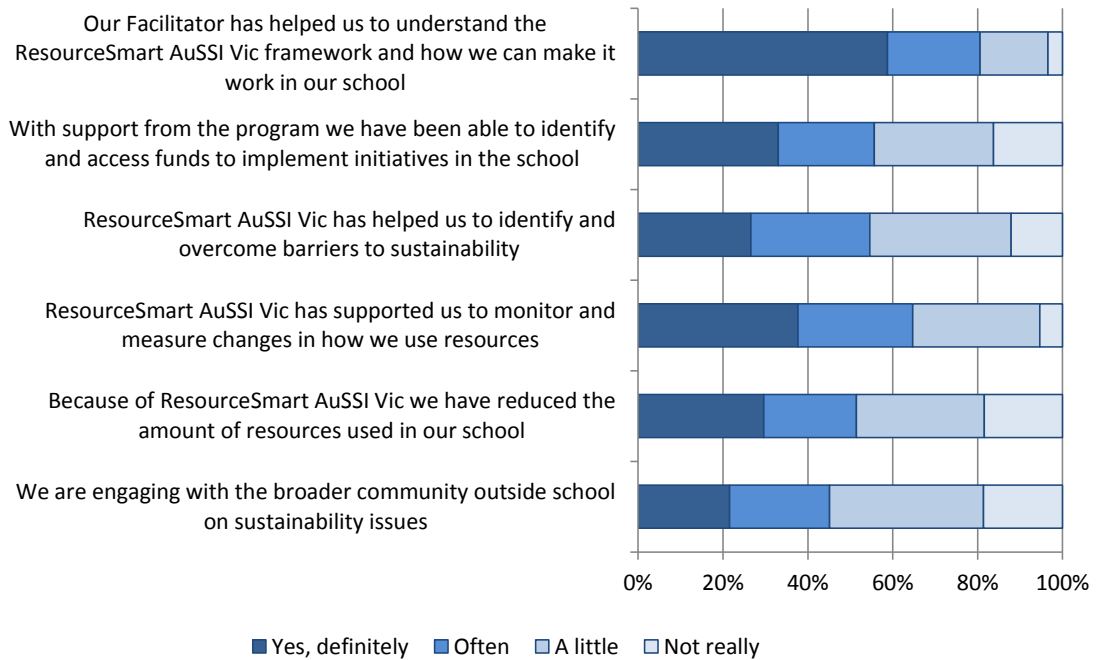
Supportive facilitation	Government funded facilitators support schools in a variety of ways, such as: suggesting activities and strategies, helping with funding applications, giving external perspectives and assisting with practical tasks (e.g. audits).
External validation	Schools gain external validation by being part of an established program that is accredited. <i>'The star level system is a great chance for schools to celebrate, it adds to media awareness if you get in the local papers etc., it is a great marketing tool for our school, and we've become renowned for it.'</i> [Government Primary School]
Local networks	A school's sustainability activities can benefit from the chance to take part in local events, link with other local sustainability programs and organisations and to learn with and from other schools.
Internal monitoring	Government-funded facilitators support schools in a variety of ways, such as: suggesting activities and strategies, helping with funding applications, giving external perspectives and assisting with practical tasks (e.g. audits).

Source: Monash University (2014), ResourceSmart Schools Research Project Final Report, Report commissioned by Sustainability Victoria, pages 29-37.

The importance of these five key aspects is further illustrated by the recent 2013/2014 progress survey of schools. In this survey, schools were questioned about the influence of RSS in supporting changes. The survey showed that RSS has provided a range of supports to schools which have been seen as valuable by schools (Figure 6).

In particular, the facilitators have helped almost all schools surveyed to understand RSS framework. Additionally, a range of other support measures (such as: providing access to funds; identifying barriers to sustainability; supporting the monitoring of changes in resource use; and engaging with the broader external community) have been seen as helpful by most schools surveyed.

Figure 6: Effectiveness of RSS in supporting schools



Source: Sustainability Victoria RSS progress survey (2014).

Notes:

1. The number of survey responses that are used in this graph varies between 204 and 206 depending on the measure.

RSS has extended its program reach

The initiative has achieved its target of involving 400 additional schools. In particular, there are 425 new schools that entered the program between 2011/12 and 2013/14.

However, we note that there has been limited involvement by early childhood facilities in the program, with the exception of nine early childhood services that have participated in a pilot program. Sustainability Victoria is still in the process of assessing the best approaches to embed RSS within early childhood facilities taking into consideration a range of issues that are unique to these facilities, particularly the learning development stage of the children, the pedagogical approaches used in services and the varied influence of facility arrangements (including ownership structures, age and condition of buildings) on resource use. We also note that composition of new schools is well spread across different types of schools in terms of government, catholic and independent (Table 3). Additionally, the type of school (primary, secondary etc) for the new schools aligns closely with the total Victorian school population (Table 4).

Table 3: Distribution of new schools by sector

Type of school	New schools into program		Total Victorian school population	
	Number	%	Number	%
Government	343	80.7%	1,537	68.7%
Catholic	56	13.2%	486	21.7%
Independent	26	6.1%	215	9.6%
Total	425	100.0%	2,238	100.0%

Source:

- (1) New schools in the program were sourced from data provided by Sustainability Victoria.
- (2) The total Victorian school population was sourced from Department of Education and Early Childhood Development (2014), Summary Statistics for Victorian Schools, July 2014.

Table 4: Distribution of new schools by school type

Type of school	New schools into program		Total Victorian school population	
	Number	%	Number	%
Primary	284	66.8%	1,549	69.7%
Primary-Secondary	41	9.6%	233	10.5%
Secondary	86	20.2%	339	15.2%
Special	14	3.3%	98	4.4%
Language	0	0.0%	4	0.2%
Total	425	100.0%	2,223	100.0%

Source:

- (1) New schools in the program were sourced from data provided by Sustainability Victoria. MJA has used various sources of information to classify schools including school web sites.
- (2) The total Victorian school population was sourced from Department of Education and Early Childhood Development (2014), Summary Statistics for Victorian Schools, July 2014.

3.1.2 Objective 2: education for sustainability is available to students at all education levels

There is a range of evidence to indicate that more than 90 per cent of schools that participate in RSS have embedded sustainability into learning and teaching activities. In particular, the recent Monash University study found that 92 per cent of participating schools surveyed had made a ‘minor’, ‘moderate’ or ‘significant’ level of progress in embedding sustainability into the curriculum. Moreover, 69 per cent had made a ‘moderate’ or ‘significant’ level of progress¹¹.

These results are very consistent with the Sustainability Victoria’s recent 2013/2014 progress survey of participating schools which shows that more than 90 per cent of schools surveyed to some extent involve students in environmentally sustainable activities and link sustainability into the curriculum at all year levels. Moreover, more than 65 per cent of schools indicated ‘often’ or ‘yes, completely’ to both these measures.

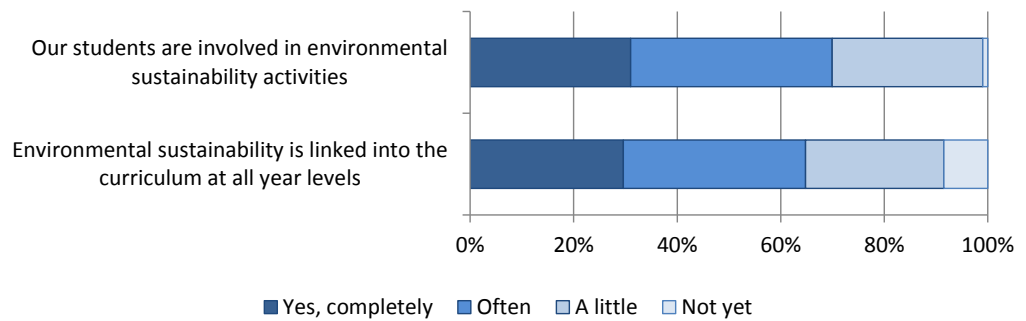
¹¹ Monash University (2014), ResourceSmart Schools Research Project Final Report, Report commissioned by Sustainability Victoria, page 14. The number of survey respondents was 160.

Sustainability has been embedded into teaching and learning in a variety of ways. Some examples include:

- embedding sustainability into the school curriculum by redesigning formal curriculum documents;
- establishing environmental studies programs which link closely with the activities to reduce resource use in the school or by using student inquiry projects and theme days to embed sustainability into learning and teaching;
- student involvement in the day to day sustainability activities of the school;
- the promotion of student leadership via ‘Student Action Teams’ which gives students the opportunity to learn about sustainability in practice; and
- document sharing through ResourceSmart Schools online.

While there has been success in schools in embedding sustainability in learning and teaching, this as yet has not reached far into early childhood facilities. This is because early piloting of the program illustrated the suitability of the modules to schools and the need to develop more specialised teaching and learning modules for early learning centres.

Figure 7: Embedding of sustainability into learning and teaching



Source: Sustainability Victoria RSS progress survey (2013/14).

Notes:

1. The number of survey responses that are used in this graph is 213.

3.2 Cost benefit analysis

3.2.1 The social cost benefit approach

A social benefit cost analysis should incorporate all of the incremental benefits and costs that have resulted from the program. In this section we have valued those benefits and costs based on available resource use and waste information as well as program costs provided by Sustainability Victoria. We note that there are some benefits and costs which we have not valued but which are discussed qualitatively in this section.

We also note that there are some complex estimation issues in estimating changes in resource use and waste over time since:

- resource levels (e.g. electricity use) will likely increase if there is an increase in student numbers at a school and conversely decrease if there is a decline in student numbers at a school;
- schools recently undergone a ‘technology’ revolution with an increase in the use of computers and hand-held devices which use electricity; and
- there are limitations in Sustainability Victoria’s data sets since not all schools provide a complete ongoing set of resource use and waste data.

To address these issues, we have attempted to adjust for student numbers in our analysis. We have also restricted our analysis of school resource data to those schools that have a complete set of data for two to three years. Additionally, to derive the typical annual benefit for each school, our analysis period is limited to two years to attempt to avoid structural increases in resource use and/or waste. This is particularly relevant for electricity, due to ongoing technology changes.

We have also only included those schools for which there was a reduction in resource use over the first year of the one to two year period of analysis. This is because for those that experienced an increase it is impossible to know what the increase would have been without the program.

Our benefit cost analysis has assumed a 4 per cent real discount rate¹².

¹² We have assumed that this program fits into the category 1 type of investment (as per the Department of Treasury Sustainability Victoria ResourceSmart Schools Evaluation 18.

3.2.2 Base case net value of the program

Based on base case assumptions, we have estimated that the program has delivered estimated net benefits of approximately \$375,000 in 2014/15 dollars. This is based on the total estimated benefits of approximately \$12.6 million being slightly larger than the estimated costs of approximately \$12.2 million.

The base case benefit cost ratio has been estimated at 1.030. This means that for every dollar spent on the program there are \$1.03 of benefits.

Table 5: Net benefits of program (2014/15 dollars)

Benefits	\$12,560,094
Costs	\$12,184,994
Net benefits (benefit minus costs)	\$375,100
Benefit cost ratio (BCR) (benefits divided by costs)	1.03

Source: MJA analysis

3.2.3 Benefits

We have quantified two types of benefit from the program:

- lower financial cost for schools as a result of lower resource use and/or waste; and
- lower carbon pollution which results from lower electricity consumption.

We have estimated the benefits for five resource types: electricity, water, landfill, paper and recycling. We have not estimated the impact on liquefied petroleum gas (LPG), natural gas and energy generation because of the small number of schools to which this applies and the nature of the existing data for these resources.

Our analysis of data provided by Sustainability Victoria of schools that have participated since the original program inception (around 2008) indicates that schools typically gain a reduction between 5 and 10 per cent depending on the resource and/or waste type (Table 6). Noticeably, more than 80 per cent of the total benefit from the program is being derived from reductions in electricity consumption by schools. Additionally, approximately 14 per cent of benefits associated with lower electricity consumption are due to lower carbon pollution¹³.

Interestingly, we have estimated a reduction in both landfill and recycling costs. This implies that schools are successfully decreasing the overall amount of resources entering the school that would either go to landfill or recycling.

We have estimated changes in resource use and waste disposal using data from between 219 and 390 schools depending on the resource type (Table 6). Additionally, we have estimated the

and Finance's Economic Evaluation for Business Cases, Technical Guidelines, August 2013, page 25) since the investment is considered low risk as technologies for changing resource use are well known and available.

¹³ The carbon savings are based on: an emissions factor (kg per kWh) of 1.17 which was sourced from Australian Government (2013), National Greenhouse Accounts Factors, July 2013; and a price of carbon on \$29 per tonne which was sourced from Australian Treasury (2011), Strong Growth, Low Pollution, Modelling a Carbon Price, page 11.

changes using the first two to three years of data. In estimating the changes we only used those schools for which there was a complete set of resource use data for at least 2 years.

Table 6: Impact of program by resource/waste type

	Electricity	Water	Landfill	Paper	Recycling	Total
Number of schools	390	329	288	225	219	425
Change in resource use (annual)	-9.0%	-8.6%	-10.5%	-9.6%	-5.3%	n.a.
Total benefits (\$m)	\$10.319	\$0.522	\$0.779	\$0.888	\$0.052	\$12.560

Source: MJA analysis.

The benefits we have estimated include the resource savings from 425 new schools entering the program over the period 2011/12 to 2014/15 and roughly one third of this number entering RSS each of the three years over this period¹⁴. Additionally, for the schools that were already in RSS prior to 2011/12, we have assumed that 25% of the savings that occur after and including 2011/12 for these schools are a result of the participation. This is because the funding for RSS from 2011/12 to 2014/15 has also been used to assist schools that are currently involved. However, to be conservative, we have only included those schools that entered RSS from 2008/09.

With the exception of water, our estimates of changes in resource use and waste are based on analysis of resource use data that schools have provided to Sustainability Victoria. The key assumptions in estimating the benefits for each resource type are outlined in Table 7 .

Table 7: Key assumptions for each resource/waste type

	Electricity	Water	Landfill	Paper	Recycling
Cost per unit of resource	\$0.19	\$2.75	\$30.43	\$4.80	\$26.57
Resource unit of measure	kWh	kl	m ³	Ream	m ³
Estimated average bill per year per school	\$44,370	\$4,931	\$6,888	\$10,961	\$1,200

Sources:

- (1) *The price per unit of resource: electricity is sourced from MJA analysis of electricity charges provided by the Department of Education and Early Childhood Development; water is based on an analysis of data provided by Sustainability Victoria; landfill and recycling is based on other projects undertaken for governments by Marsden Jacob; and paper is based on estimate of bulk ream costs from Officeworks. We note that the landfill cost per unit includes transport, collection, gate and avoided externalities (but not the market value of the avoided recycling). The recycling cost includes collection, processing and transport.*
- (2) *The estimated average bill is based on resource use data provided by schools to Sustainability Victoria.*

Note:

- (1) *The price per unit of resource for water and electricity is based on the usage component of charges.*
- (2) *The average bill per year per school in this table is not representative of all schools in Victoria. Our preliminary analysis shows that the average bill (based on consumption) for participating schools is above that of non-participating schools.*

¹⁴ Using resource use data provided by Sustainability Victoria.

Our estimated change for water is based on the average change of the four other resource types. This is because we were not able to confidently use the available data to establish an underlying change in water use because of volatility in the water use at a school level. We understand from Sustainability Victoria that this is likely due to issues such as one-off water leaks, taps left on or the filling of a school pool.

In estimating benefits, we made some assumptions about what would have occurred in the absence of the program – ‘the counterfactual’. In particular, we have assumed that the base case changes in annual resource use and/or waste last for five years. This means that schools would not have undertaken the changes without the program for this length of time. This assumption is explained in more detail in section 3.1.1.

In estimating benefits, we are aware that in some cases schools were already involved in sustainability activities prior to being involved in ResourceSmart Schools or other local and/or state government sustainability programs. With this in mind we have assumed 65 per cent of benefits can be attributed to RSS, on the basis that:

- 51 per cent of schools in Sustainability Victoria’s 2014 progress survey indicated being involved in RSS has either ‘often’ or ‘yes, definitely’ led to a reduction in the amount of resources used in their schools. This increases to 83 per cent if we include those that indicated ‘a little’; and
- in a recent study by Monash University¹⁵, 44 per cent of schools surveyed stated they would not have implemented sustainability without RSS, noting that this increases to 51 per cent if we exclude those that were not sure. Additionally, 68 per cent of schools surveyed in the same study indicated that RSS had ‘kick-started’ sustainability activities.

We note that there are program benefits that we have not quantified.

An important benefit is the impact that the program has on educating both teachers and students about the benefits of sustainability which can be applied in other environments. For example, there are likely to be savings in resource use and waste in the home environment from improved sustainability activities.

As the program has become more regionalised (through the development of regional participating schools workshops and regionalisation of auditing services), the program has built regional capacity to progress resource savings.

Another benefit may be that RSS has resulted in better coordination of service to schools by NGOs and Government organisations providing sustainability education to schools – this coordination may disappear if funding ceases.

We have not quantified these benefits due to lack of data and research in this area.

3.2.4 Costs

The program costs that we have quantified are outlined in Table 8. The largest costs relate to: the energy efficiency grants of \$10,000 provided to each participating school; the school facilitation provided by external providers; and management by Sustainability Victoria.

We note that there are program costs that we have not quantified. For example, we have not costed the time taken by teachers to allocate to sustainability activities. However, we note that there is no anecdotal evidence that schools have increased overall teacher numbers to

¹⁵ Monash University (2014), ResourceSmart Schools Research Project Final Report, Report commissioned by Sustainability Victoria, page 42. The number of survey respondents was 160.

accommodate for the program. However, we note that anecdotal feedback from schools is that this program creates extra work for teachers (they generally don't get additional resources to support them) and that, in the best cases, teachers do get an allowance of non-classroom time to allocate to sustainability activity. Additionally, based on discussions with Sustainability Victoria, we are aware that a small number of schools have used funds over and above the \$10,000 grant to fund changes to their infrastructure. We note that we have not included these costs because of data limitations.

Table 8: Expenditure composition

Expenditure type	Present value of costs (in 2014/15 dollars)	% of total
Energy efficiency grants	\$4,561,284	40%
School facilitation and co-ordination	\$3,084,271	23%
Sustainability Victoria management (incl. contractors)	\$2,185,615	18%
Information technology system development and management	\$981,895	9%
Professional development for facilitators/ co-ordinators	\$853,283	7%
Other (including awards)	\$518,646	4%
Total	\$12,184,994	100%

Source: The costs are based on expenditure information and other estimates provided by Sustainability Victoria.

Notes:

1. The costs are for 2011/12 to 2014/15. The costs for 2011/12 to 2013/14 are actual costs while 2014/15 is a forward projection.
2. Note that the costs for 2014/15 are forward estimates and are subject to change.

3.2.5 Sensitivity analysis

We have examined how sensitive the results are to changes in two of the key assumptions:

- assumption 1: the number of years for which the benefits last. We have assumed a low case of 2 years and a high case of 8 years, noting that the base case assumes 5 years.
- assumption 2: the attribution of the total resource benefits to the program. We have assumed a low case of 50 per cent and a high case of 80 per cent, noting that the base case assumes 62.5 per cent.

Under this analysis, the benefit cost ratio varies between 0.4 and 1.6 (Table 9).

We also acknowledge that because of data limitations we have used a sample of schools to estimate resource/waste savings. We estimate that the margin of error (at a 95 per cent confidence interval) on resource use/waste savings across the five resource and waste types is, on average, about 24 per cent. We have subsequently assumed a high case of 24 per cent above base case resource use/waste savings and a low case of 24 per cent below base case resource use/waste savings. Under this analysis, the benefit cost ratio varies between 0.78 and 1.29 (Table 9).

Table 9: Sensitivity analysis

Scenario	Net benefits	Benefit cost ratio (BCR)
Base case (5 years length and 62.5 per cent attribution)	\$375,100	1.03
Benefit length = 2 years (low case)	-\$7,359,531	0.40
Benefit length = 8 years (low case)	\$7,644,879	1.63
Attribution = 50 per cent	-\$1,388,180	0.89
Attribution = 80 per cent	\$2,355,338	1.19
Resource/waste savings -24% of base case	-\$2,734,468	0.78
Resource/waste savings +24% of base case	\$3,544,760	1.29

Source: MJA analysis.

4. Funding/delivery and efficiency

4.1 Funding/delivery

4.1.1 Scope and budget

RSS has delivered the initiatives that were stated in the Budget Expenditure Review Committee (BERC) funding application to the Department of Treasury and Finance (DTF). In particular, as illustrated in Table 8, the program has provided grants to schools and supporting facilitation and co-ordination. This was exactly what was intended under the BERC funding bid for the program.

Under the grants mechanism each regional program coordinator was allocated a fixed number of grants and charged with the task of registering that number of schools with RSS. As a result in all regions except Grampians and Hume the number of registered schools equated to the number of grants allocated to that region. In the case of Grampians and Hume a competitive process was instituted based on quality of application and alignment of the proposed activities with eligibility (allowable resource infrastructure technologies that could be purchased) criteria. In some cases, schools had proposed expenditures that were not eligible such as water tanks or solar panels. In these cases schools were required to revise proposed expenditures to fit with those listed under the guidelines.

Additionally, over the four year program period, expenditure has been slightly less than what was allocated to the program through the BERC process, noting that the program is yet to reach completion and the 2014/15 costs are forward estimates that are subject to change. This is illustrated as the BERC funding carryover (cumulative net position) in Table 10. We note that Sustainability Victoria has spent more on the program than what was allocated under the BERC process. The residual amount has been funded by Sustainability Victoria from its state budget allocation. We further note that the program costs applied in the benefit cost analysis in section 3.2 has used total program expenditure.

Table 10: Funding and expenditure (nominal dollars)

Expenditure type	2011/12 (A)	2012/13 (A)	2013/14 (A)	2014/15 (E)
Total program expenditure	\$2,545,710	\$2,722,649	\$3,548,023	\$2,267,898
Original BERC funding allocation	\$2,000,000	\$2,050,000	\$2,351,250	\$2,000,000
BERC funding applied to this year	\$1,707,716	\$2,171,620	\$2,436,295	\$2,068,923
Net (BERC funding allocation minus BERC funding applied)	\$292,284	-\$121,620	-\$85,045	-\$68,923
BERC funding carryover (cumulative net position)	\$292,284	\$170,664	\$85,619	\$16,696
Sustainability Victoria funded (total program expenditure minus BERC funding applied)	\$837,994	\$551,029	\$1,111,728	\$198,975

Note 2014/15 expenditures are estimates and may change by the end of the financial year.

Source: MJA analysis of information and data provided by Sustainability Victoria.

4.1.2 Timing and governance

RSS has been delivered within the expected timelines. In particular, the target of over 400 new schools was delivered early in the fourth year of the program. In practice, RSS has been co-ordinated and managed by Sustainability Victoria. However, the Department of Education and Early Childhood Development has been directly responsible for managing the energy grants process. While this does not appear to have impacted program delivery, there may be alternative management structures which are more integrated that could be considered if the program continues with a grants component.

4.2 Efficiency

4.2.1 Cost efficiency

Assessing the costs effectiveness of RSS against other like programs is challenging given differences in objectives, coverage and measurement methodologies.

The cost effectiveness of RSS has generally improved over time as underlying processes and tools are embedded in the program and efficiencies are found in the way the program is run and operated, examples include:

- the place-based model has resulted in local delivery of RSS to local schools by local service providers
- intensive workshops of groups of school have been developed to replace, in some circumstances, one on one extension activities to assist schools with implementing the framework
- automation of self-accreditation and SV certification processes

An important consideration when assessing cost effectiveness are the costs directly attributable to resource savings versus other costs directed at education objectives.

Our assessment is that approximately less than half of the program expenditures have been directed exclusively at grants funding. Of the grants funding approximately half was directed at expenditures on resource audits to identify resource saving potential and on resource saving technologies allowed under the guidelines. The other half has been directed at education outcomes. When the resource savings are considered against the direct costs of delivery of resource saving technologies, the cost efficiency of the subsequent resource savings has been sound.

4.2.2 Process and downstream efficiencies

RSS has been more successful achieving energy savings and achieving uptake of the program by Primary Schools (reflecting the relatively higher number of primary schools to secondary schools in Victoria) — these are sensible and effective foci.

- energy represents the largest resource cost in schools and offers largest scope for efficiency savings. Most audits undertaken identify improving energy efficient infrastructure as a key low cost way of achieving resource savings. Nonetheless based on the number of schools completing the teaching and learning resources energy module, energy is relatively under represented compared with the use of other teaching and learning resources;
- audits frequently identify the installation of lower energy consumption lighting and timer mechanisms on use and key technologies. With the increasing use of information technologies (IT), audits are increasingly identifying high electricity consuming IT servers as opportunities for savings. However given their expense there is a substantial gap in the capacity of schools to invest in more energy efficient IT servers; and
- primary schools are an appropriate initial target of RSS given the importance of early learning to achieving long term practice change in sustainability and noting the influence of early learning on behavioural change there are likely to be opportunities to better customise education and learning resources for early childhood learning centre and kindergartens.

Over the course of RSS the program has achieved a high level of penetration into primary schools. A key issue for primary schools and future design of the program is how it can more effectively target non-participating primary schools who may not be participating because of lack of awareness of the program or judgements that the program may not sufficiently address perceived transaction costs or perceived alignment with existing curriculum or priorities.

Nine Early Childhood Services have participated in RSS via a pilot funded through the BERC bid. Evidence from the pilot indicates that, in order to effectively implement RSS into this sector, significant customisation of the teaching and learning resources modules to reflect difference in the learning approaches and built environment would be required.

The number of secondary schools adopting the program is lower in absolute terms than primary schools in part reflecting the larger share of primary schools to secondary schools across the State. However, secondary schools generally have significantly larger school populations and in turn significantly larger resource use per school. As such secondary schools are likely to represent an important source of low cost energy savings.

We note that the core objective to improve resource efficiency is not dependent on successful implementation of the education component. The education component is complementary to, but not necessarily a substitute for, prudent infrastructure investment. The teaching and learning resource modules can provide the capacity and know how to amplify resource savings from infrastructure investments.

Over the course of the program, resource auditing of participating schools has become more contestable. Early in the program auditing was exclusively performed by CERES. Allowing new entrants to compete for auditing services has provided more choice to schools and likely contributed to a fall in audit costs thereby enabling more of the grants to be used for investment infrastructure and practice change. Increased contestability has also led to more regionalised delivery of RSS services and in turn this has led more joined up information and knowledge sharing within participating regional school communities.

4.2.3 Achieving efficiency gains

Resource savings are being primarily discovered through the resource audit process. There are likely to be efficiencies by encouraging a more direct relationship between individual school and their utility providers. Currently public schools have a relatively less direct relationship with electricity providers as the service agreement is negotiated at a regional scale through the Department of Education and Early Childhood Development.

There appear opportunities to increase the linkages with complementary programs to reduce the level of compliance and red tape associated with RSS. Data held by other arms of Government and other programs could be shared with RSS. For example:

- the Department of Education and Early Childhood Development records public school electricity meter data (consumption and charges); and
- schools participating in the SWEP program have water meter data remotely recorded on the SWEP web site.

This data could be automatically loaded to ResourceSmart Online (noting that investment in information technology would be required to do so) and enable schools to have accurate real time consumption data. Tools could be built within the data base to enable self-examination of the remote metered data and school billing data.

The mixing of program objectives for resource saving education and practice change may be limiting the scope of adoption to the program. There could be opportunities to clarify and separate the objectives of the program and their focus. For example, the energy saving objective could be focused on particular schools cohorts such as:

- schools that have yet to implement energy savings. With many primary schools already participating, the remainder not participating could be targeted just for energy savings.
- secondary schools without also incorporating education and learning modules. Some secondary schools do not participate in the program given existing science and geography curriculums with sustainability components and the costs associated with incorporating RSS modules.

There is a range of ways in which the costs of RSS could be lowered, including:

- adopting a ‘no questions asked’ list of creditable energy saving technologies that are eligible for direct grants and accredit ongoing resource savings without the need for database recording. Currently, savings are not accredited when schools do not complete or accurately record consumption and billing data in the database. This is despite many savings being ongoing through the installation of long lived technology;
- not requiring billing data to be recorded for accreditation and implementing random compliance auditing; and

- allowing lower wattage lighting to be installed without changing entire light fittings. Department of Education and Early Childhood Development guidelines encourage schools installing lower wattage lighting to install new light housings.

There may be efficiencies in refocusing the database reporting away from a tool to report aggregate resource cost savings to better enabling schools to monitor progress in lowering resource consumption and expenditure. The database presently has too many data gaps, inaccuracies and confounding factors affecting consumption and charges for it to be a reliable tool to measure program savings across the entire program. Too many of the data idiosyncrasies are individual school context specific.

It is possible that some schools with a good understanding of their previous resource consumption and changes under the program can monitor and understand progress. However, it is likely that for many schools a key limitation of the database is that it does not require the identification of the specific changes within the school that have led to resource and/or waste savings and does not have the capability of attributing resource savings to that change.

Schools could still be encouraged to record their progress, but also include reporting on the types of technology changes and practice changes rather than simply recording billing data per se. In the absence of such an approach, the challenge for Sustainability Victoria is that understanding billing data is largely a case by case exercise. Indeed, it may be better to undertake a case study approach of a select number of representative schools so that the complexities can be properly considered in estimating benefits and costs.

Sustainability Victoria and the Department of Education and Early Childhood Development (DEECD) have estimated that around one third of all the energy efficiency grant funding is expended directly on resource savings technology. As a result, the benefits from the program are smaller than they otherwise might be. In general, around one third of the energy efficiency grants have been used for professional development of staff in sustainability pedagogy. While this can improve educational outcomes over the longer term, it may not directly lead to measurable savings in the short to medium term.

The grants approach does not clearly discern how funding can be best spent to achieve resource savings and education outcomes. Currently, there is no mechanism to neither weigh and balance investment options nor arrive at the 'right' balance between the two program objectives.

The energy efficiency grants program has been regionally quota based and as such does not encourage a competition for grants among schools within regions nor across regions. As a result, the grants mechanism does not enable the identification of best value for money resource savings within and across schools but does so indirectly through the identification of allowable expenditures under the guidelines.

The high proportion of participating schools that have undertaken resource audits with the grants indicates that there is a significant information gap on the scope and focus of resource savings yet each school can directly gain from the saving.

One approach could be to provide some further guidance on how resource saving grants be expended with Sustainability Victoria providing guidance on the cost and return of a feasible range of technology options. An evaluation of resource audits would assist with this and provide guidance to new participating schools. In a similar vein, grant funding could be made more contestable and require participating schools to present short business cases for proposed grant expenditures based on audit data and savings potential of know technology and practice changes. Sustainability Victoria would then have some basis to compare investment alternatives

and transparently arrive at an appropriate balance between achieving resource saving outcomes and education outcomes

5. Risk

In this section we consider the risks of not continuing with RSS and potential mitigation strategies that could be employed to reduce these risks.

5.1 Risks of ceasing program

RSS makes a substantive contribution to addressing a number of observable market failures relating to inefficient resource use. In the absence of RSS it is reasonable to expect a generally higher level of resource use in schools than would otherwise be the case. A critical question is *the degree to which* ceasing the program would increase resource use and given the costs of the program are the costs worth incurring or are they worth avoiding?

To date the majority of RSS expenditure has been directed at more resource use audits and energy efficient lighting (this includes for example lower wattage light globes and the connection of timers to lighting). Audits address gaps in information required to achieve resource savings. Ceasing audits would result in continued information gaps. While many of the resource savings achieved from embedding new technologies would continue in the absence of renewed funding, it is likely associated practice change would slip without supporting resources to schools.

In some instances there may be issues where the embedded technology has a finite life and as depreciation of the asset occurs there are higher maintenance or replacement costs than there would be with less energy efficient technology (e.g. lighting timers, solar panels). In the absence of RSS there may be diminished capacity of schools to maintain their energy efficient asset base. Given the change in lighting standards coming into effect post 2014 there is an argument that RSS is not needed to address this aspect of lighting inefficiency.

Over time RSS has captured the lower cost energy savings. Audits have generally targeted the lowest cost and most practical energy savings as set out in the allowable technology guidelines. They have also highlighted opportunities for behaviour change. Absence of RSS in the future is likely to mean there are fewer opportunities to improve energy use in primary schools not currently involved in the program. Moreover, ceasing the program is likely to limit the scope for improved energy efficient outcomes in secondary schools. For example if the savings in primary schools were to be mirrored in secondary schools larger environmental benefits could be expected given the relative size and resource consumption of secondary schools.

We note that the coverage of the program is higher in primary schools than in secondary schools and limited in early learning services. As discussed earlier, in general, early learning services (e.g. kindergartens, child care centres) have lesser scope to utilise current learning modules. Furthermore, kindergartens operate within more narrowly defined times than primary schools and given their size the energy use choices of staff are more transparent and directly linked to energy consumption – that is, there are fewer collective action problems than in multiple roomed primary schools. Nonetheless, the provision of appropriate education and learning resources in early learning centres and kindergartens during this period of behaviour formation

could be expected to have a significant impact on long term behaviours and attitudes to resource use.

Continuing the program has a number of risks. Having generally captured the ‘low hanging fruit’ – it is likely that attracting new schools to the program will become increasing harder and the costs of achieving equivalent resource savings generally more expensive (noting though that the unit cost of comparable energy efficient technology is generally falling overtime as a result of falling production costs).

In the 2010 and 2012 evaluations of RSS, schools were asked to comment on the potential consequences of if RSS was to cease. Feedback from participating schools focussed more on the risks of ceasing the program on sustainability education outcomes than on reducing resource use per se. The broadly stylised concerns included losing:

- momentum;
- sight of focus and priorities; and
- incentives because of loss of the accreditation and rating system.

Here we recognise that different schools are at different levels of sustainability and motivation. Some are self-initiated with the program providing additional direction motivation and resources, whereas at the other end of the spectrum some schools new to the program are less developed in the sustainability program and would quickly lose direction and wherewithal.

Ceasing RSS is likely to have negative consequences for Sustainability Victoria and the Victorian Government with the general public likely to perceive it as a decline in green credentials. Ceasing RSS is likely to be interpreted by the community that Sustainability Victoria is being less environmentally conscious and reducing its commitment to environmental outcomes in schools.

Ceasing RSS is also likely to affect broader longer term sustainability goals as the resultant decline in education for sustainability would likely diminish the potential for wider sustainability outcomes outside of school.

It is also likely that ceasing RSS would have negative consequences for the Victorian government partnership arrangements with the Australian Government and other state jurisdictions delivery education for sustainability initiatives under the broader AuSSI umbrella.

5.2 Mitigating risks

Some of these risks could be mitigated in a variety of ways. For example:

- If RSS was to cease, emphasis could be placed in delivering like outcomes through existing complementary programs, such as the DEECD Schools Water Efficiency Program.
- The Government could place emphasis on encouraging schools to build their own practice change and investment pathways and increase the relationships between utility providers and the school administration, teachers and students to achieve this.
- The government and Sustainability Victoria could emphasise their commitment to sustainability in schools by contributing other complementary programs and emphasising other sustainability programs.

6. Conclusions & recommendations

This evaluation has found RSS has made a positive contribution to resource savings and education outcomes of participating schools.

Participating schools would not have the information, resources and wherewithal without the program to achieve like savings in resources. Education outcomes in the program have helped to leverage resource savings and contribute to wider community outcomes.

The level of resource savings has been substantive. Participating schools have reduced expenditures on resources such as electricity gas water, and waste in the order of \$12.6 million as a result of sustainability actions by schools between 2011/12 and 2014/15. We note some of the benefits of the program are likely to extend beyond this time frame.

RSS has delivered net positive benefits with the value of resource saving slightly exceeding the costs of delivery. Compared to other like programs, the direct expenditures on resource savings have been cost effective.

There is merit in continuing the program and as the number of primary schools in the program becomes saturated, the focus of RSS should shift to becoming more attractive for secondary schools to participate. This may require a delineation of resource saving investment from education modules.

There are opportunities to improve the efficiency of the program by better integrating data captured by complementary programs, Department of Education and Early Childhood Development resource use data and billing and new remote utility metering technologies. There are also opportunities to increase the contestability of auditing and enabling savings from accredited saving technologies to be recognised on an ongoing basis without the need for school use data.

Appendix 1: Framework and methods

Table 11: Module description and benchmarks

Module and description	Min actions for module completion	Benchmarks	Aspirational targets
<p>Core</p> <p>Evaluate where you are, where you want to get to, and how you will get there.</p>	<ul style="list-style-type: none"> 24 of 24 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None
<p>Biodiversity</p> <p>Protect and improve the land, the local ecosystem, and plant and animal habitats.</p>	<ul style="list-style-type: none"> 34 of 48 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> 50% habitat improvement from baseline year 60% weeds reduction from baseline year
<p>Waste</p> <p>Implement a planned approach to waste management to maximise reuse of materials and minimise waste sent to landfill.</p>	<ul style="list-style-type: none"> 47 of 63 	<ul style="list-style-type: none"> Maximum waste to landfill level per student per year: <ul style="list-style-type: none"> Primary or secondary school: 0.3 m³ 	<ul style="list-style-type: none"> 70% reduction in waste to landfill from baseline year
<p>Water</p> <p>Improve water usage in the school grounds and the community.</p>	<ul style="list-style-type: none"> 32 of 57 	<ul style="list-style-type: none"> Maximum mains water usage level per student per year: <ul style="list-style-type: none"> Primary or secondary school: 4 kilolitres 	<ul style="list-style-type: none"> 40% reduction in mains water use per student from baseline year
<p>Energy</p> <p>Work on energy conservation, energy efficiency, reducing greenhouse gases and improving air quality.</p>	<ul style="list-style-type: none"> 26 of 65 	<ul style="list-style-type: none"> Maximum energy usage level per student per year: <ul style="list-style-type: none"> Primary: 250 kilowatt-hours, 0.4 tonnes CO₂, and 0.9 gigajoules Secondary: 400 kilowatt-hours, 0.6 tonnes CO₂, and 1.4 gigajoules 	<ul style="list-style-type: none"> 50% reduction in greenhouse gas emissions from baseline year 80% reduction over the longer term.