

## Down To Earth Research

ABN: 38 873 356 803  
Tel: (03) 9708 8008  
Fax: (03) 9787 0367  
Email: [admin@dter.com.au](mailto:admin@dter.com.au)  
Web: [www.dter.com.au](http://www.dter.com.au)

# Dairy Australia

## Smarter Energy Use Program 2013-2015 Evaluation

### Report

**April 2015**

**Primary contacts for Dairy Australia:**

Catherine Phelps  
Alison Kelly

**DTER report authors:**

Pamela Watson  
Daniel Watson



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### Executive Summary

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# Executive Summary

## Background and methodology

The Smarter Energy Use program was developed by Dairy Australia under the Caring For Our Country initiative. The program has run between 2013 and 2015 and its primary aim has been to reduce energy consumption on dairy farms by providing dairy farmers with a formal plan to address inefficiencies identified during an assessment of where power is being consumed in the dairy.

The program attracted substantial interest, with 900 farmers initially registering to have an energy assessment of their dairy conducted. Due to the high level of interest and encouraging program outcomes, additional funding was made available to conduct a further 500 assessments in a second phase of the program. In total, 1,400 dairy farmers participated in program and had a trained assessor review their dairy and provide them with an Energy Efficiency Plan.

This Evaluation Report provides information based on data collected during the monitoring and evaluation components of both Phase 1 and Phase 2 of the program. Insights included in the report are based on a series of telephone interviews with a random sample of program participants from each of the three evaluation components:

- **Component 1:** Consisting of dairy farmers just after an assessment was conducted
- **Component 2:** Consisting of dairy farmers after receiving their Energy Efficiency Plan
- **Component 3:** Consisting of dairy farmers interviewed 1 year after receiving their Energy Efficiency Plan.

Component 1 interviews (conducted post assessment with 33 respondents) were conducted by program co-ordinators to determine whether dairy farmer contact with assessors had been positive and informative. These interviews were only conducted after Phase 1 of the program and were used to inform the development of the program.

Component 2 interviews were conducted by Down To Earth Research (DTER) consultants who contacted a random sample of 79 dairy farmers after they had received their Energy Efficiency Plan. The aim of these interviews was to measure the impact of program participation on energy efficiency awareness as well as the likelihood of considering making changes to reduce energy consumption.

Component 3 interviews were also conducted by DTER consultants and included a random sample of 80 dairy farmers approximately 1 year after they received their Energy Efficiency Plan to determine whether it was being used as a reference and if so, measure its impact on dairy farmer attitudes and decision making relating to energy consumption.

## Evaluation results: Key findings

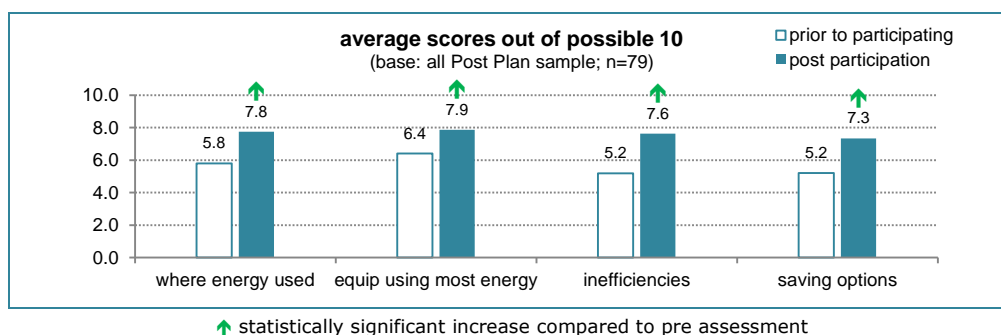
### Demographics of Smarter Energy Use Program participants:

- ❖ Demographic measures taken during the evaluation process reveal the Smarter Energy Use program has appealed to a broad range of dairy farmers, but participants are more likely than the industry average to be younger, have larger herds and be in an expansion phase. While most milk their herd twice daily, this is typically done in a range of shed types.

measure	smarter energy use program participant average	national average <sup>(1)</sup>
Age (years)	48	53
Milking herd size (cows)	360	304
In an expansion phase	34%	23%

### Program impact and outcomes:

- ❖ The key driver to participate in the program has been the likelihood of saving money through reduced power bills, but evaluation results reveal the program has significantly increased awareness of energy use in the dairy. The chart below details dairy farmer respondent self ratings out of a possible 10 points on 4 key measures prior to having an assessment conducted compared to after receiving results of the assessment:



- ❖ Additionally, 79% of respondents said their attitude towards energy consumption generally has changed as a result of participating in the program, mainly in terms of being more conscious of turning equipment off when it is not operational and/or considering the energy efficiency rating of new equipment being purchased.

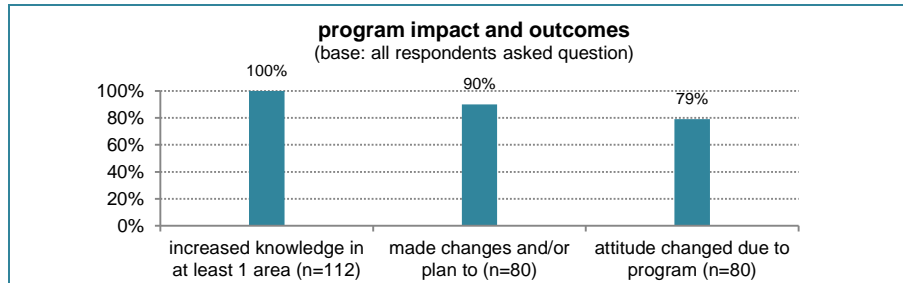
<sup>(1)</sup> Based on results from Dairy Australia's National Dairy Farmer Survey 2014

It is notable that the 21% of respondents saying their attitude didn't change as a result of program participation attributed this to being focused on keeping power use to a minimum already, even though this was typically related to minimizing power consumption costs. The following comments are an example of how attitudes have changed due to program participation:

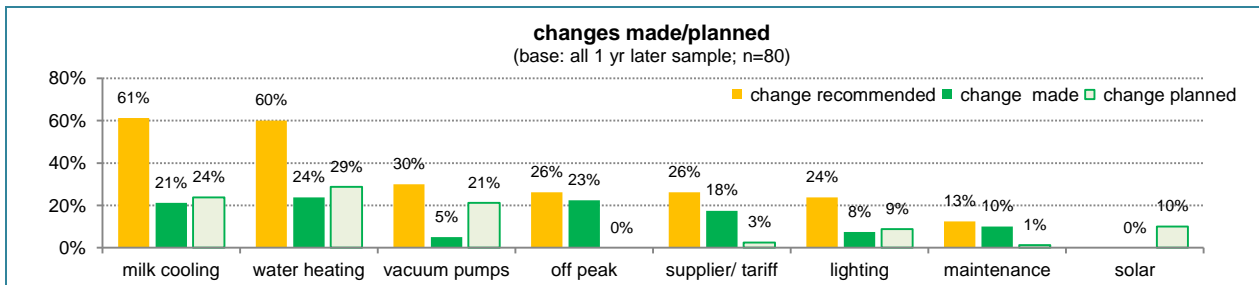
*"We now turn the lights off in the dairy as soon as it is light and we turn the yard light off when it is light enough to see. We also turn off everything as soon as we leave the dairy – fans, equipment and the like."*

*"We are now a lot more aware of looking at inefficiencies of equipment and making sure we do the maintenance required to keep machines running at their peak efficiency."*

*"Having the assessment conducted has meant that when I was looking for a new water heater, I factored in the energy efficiency of the equipment as well rather than just looking at size and cost."*



- ❖ The majority of evaluation respondents have used their Energy Efficiency Plan to prioritise and guide decisions, particularly in terms of purchasing new equipment (or intend to do so in future). Recommendations made in the Plan and being put into effect are shown in the chart below:

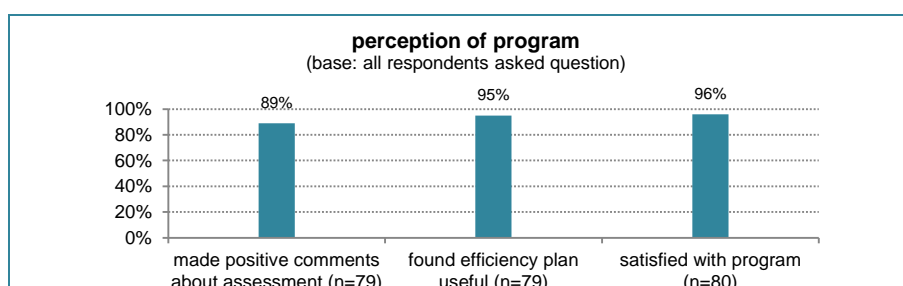


- ❖ Costs associated with replacing existing equipment and machinery is the main barrier to implementing recommended changes, particularly where equipment is still functioning. Several comments similar to the following were made:

*"The Plan showed the water heater we have is really inefficient, but it is still working and I don't plan on replacing it until it breaks down. When it does break down though, I will certainly look at purchasing a more efficient heater."*

### Perception of the program:

- ❖ The vast majority of dairy farmers participating in the program made positive comments about the program's assessment process believing it to be relatively efficient and interesting. In Phase 1 of the program, a few respondents reported having difficulty providing assessors with accurate information on the length of time equipment runs, but this does not seem to have been a problem for Phase 2 respondents.
- ❖ A very high 95% of evaluation respondents have found their Energy Efficiency Plan *very* or *fairly* useful, typically due to the provision of benchmark data as well as the identification of energy and money saving potential. For some respondents, Plans would have been more useful if information on electricity tariff options, new technologies and renewable energy options was included. There is also some demand for irrigation equipment efficiency assessments.
- ❖ Overall satisfaction of the program has been widespread, with a very high 96% of respondents *very* or *fairly* satisfied. It is notable that Phase 2 respondents are significantly more likely than Phase 1 respondents to say they are *very* satisfied (57% compared to 32%), indicating that changes made based on some of the formative data collected in Phase 1 have resulted in beneficial outcomes.



## Program structure





- ❖ Awareness of the Smarter Energy Use program was created through a variety of means, highlighting the importance of a multipronged communication strategy for programs of this nature. Promotion through RDPs in certain regions was beneficial, particularly when used in conjunction with other methods.
- ❖ Dairy farmers were mainly attracted to the program by potential cost savings and this finding reaffirms that communication strategies for similar programs should focus on this factor to encourage participation.
- ❖ After some initial difficulties in identifying suitable assessors for the Smarter Energy Use program, those eventually selected managed to provide dairy farmers with most of the information required throughout the assessment process. Holdups with developing Energy Efficiency Plans caused some concern among dairy farmers in the early stages of the program and future programs need to ensure the time between having an assessment conducted and receiving a Plan is minimal.



## Program learnings

- ❖ In future, similar programs can benefit from some of the difficulties experienced in rolling out the program as well as findings from the evaluation, namely:
  - Multi-pronged communication strategies are likely to be the most successful in encouraging participation and interest in the program.
  - Assessors employed to undertake on-farm energy assessments must be encouraged to be reliable and submit Energy Efficiency Plans within a short period of being on farm.
  - Assessors must have good communication skills and knowledge of energy use.
  - Some farmers will require assistance to collect data on duration of machinery use required for the assessment and it may be worth offering additional assistance or explaining that an estimate is all that is needed.
  - Some dairy farmers expected to receive guidance with purchase decisions, ie. the size and brand of equipment most suited to their situation. It is worthwhile explaining parameters and boundaries of programs in their early stages.
  - If a more rapid rate of change is desired, then grants or rebates will need to be offered.
  - There is some interest in using alternative power options and this information could be provided in future.

## Assumptions informing program

- The Smarter Energy Use program was informed by several assumptions, each of which was tested in this evaluation. Data collected shows that all 6 assumptions have been proven:

<p><b>Assumption 1:</b></p> <p>At least 1,400 dairy farmers will register for energy assessments.</p>		<ul style="list-style-type: none"> <li>• 1,400 dairy farms registered for the program and an assessment of energy use in the dairy was conducted on each of these farms.</li> </ul>
<p><b>Assumption 2:</b></p> <p>Suitable people will be found to conduct assessments on farm.</p>		<ul style="list-style-type: none"> <li>• After some initial difficulties, a knowledgeable and reliable group of assessors was found in each dairy region.</li> </ul> <p><i>"The assessor was excellent and really easy to talk to. I had a great experience – the assessor made it easy, he explained it well and was very patient."</i></p>
<p><b>Assumption 3:</b></p> <p>Dairy farmers will be able to provide information for the assessment relating to energy consumption</p>		<ul style="list-style-type: none"> <li>• While providing reliable information has not been a problem for most of the dairy farmers interviewed, there have been some for whom this proved difficult.</li> </ul>
<p><b>Assumption 4:</b></p> <p>Participation in the program will result in greater awareness of energy saving opportunities and efficient options for the dairy.</p>		<ul style="list-style-type: none"> <li>• There is clear evidence the program has increased knowledge among participating dairy farmers, with almost all learning at least one thing and rating their knowledge higher in 4 key areas.</li> </ul>

<p><b>Assumption 5:</b></p> <p>Participation in the program will result in changed attitudes towards energy consumption.</p>		<ul style="list-style-type: none"> <li>The vast majority of dairy farmers interviewed for this evaluation stated that participation in the program changed their attitude and they are now more aware of turning off lights and equipment when it is not in use. Additionally, the energy consumption of any new equipment purchased will be factored into decision making.</li> </ul>
<p><b>Assumption 6:</b></p> <p>Participation in the program will result in changes in the dairy likely to reduce overall energy consumption.</p>		<ul style="list-style-type: none"> <li>A substantial amount of change has already occurred and is likely to increase further as funds become available and machinery needs replacing.</li> </ul>

## Conclusions and recommendations

- The model used to promote the Smarter Energy Use program has clearly been successful and should be considered for future programs, with particular emphasis on opportunities where costs can be reduced by decreasing power consumption.
- It is notable that dairy farmers participating in the Smarter Energy Use program are typically younger and with larger herds than 'average', suggesting the program has appealed to those most likely to achieve the greatest benefits from reducing power consumption.
- Overall, the program's structure and processes have worked well, with only a few minor changes required during its lifespan. Recommendations made in the formative phase of the evaluation were embraced and actioned by the Dairy Australia project team, resulting in widespread satisfaction among the dairy farmers participating. In an endorsement of the program, some participants deemed it 'the most useful Dairy Australia program' they had undertaken.
- Although there were some challenges in finding a suitable and reliable team of assessors, those conducting the majority of the energy audits have had a positive impact on dairy farmer awareness, knowledge and satisfaction with the program and its processes.
- There is substantial evidence to conclude the Smarter Energy Use program has been successful, achieving all its goals and resulting in good outcomes for the vast majority of dairy farmers participating.
- DTER conducts a substantial amount of work in the dairy industry covering a wide variety of issues and farm practices. In DTER's opinion, one of the factors in the Smarter Energy Use program's success is linked to having individual assessments conducted on farm rather than a more generic program of workshops, etc. Farmers often comment to DTER consultants that they struggle to apply generic information to their farm or farming systems, preferring information specifically laid out for their situation.

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### Main Report

**April 2015**

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# 1. Background, objectives and methodology

## Background

The Smarter Energy Use on Australian Dairy Farms project was developed to assist farms to realise their potential for energy savings by conducting energy efficiency assessments. The project was administered by Dairy Australia with funds provided under the Caring For Our Country initiative.

Initially, funding was made available to conduct Energy Efficiency Assessments on 900 dairy farms across Australia. Due to the substantial success of the project, additional funding was made available to undertake a further 500 energy efficiency assessments in a 2<sup>nd</sup> phase of the project that ran immediately following the 1<sup>st</sup> phase.

To ensure the project achieved its ultimate goal of increasing awareness of where energy can be saved on dairy farms, a monitoring and evaluation plan was developed that included the following components:

- Component 1: Feedback from dairy farmers post assessment, but prior to receiving their Energy Efficiency Plan in Phase 1 of the program (referred to in report as Post Assessment sample).

This component was included to ensure the process of having an energy assessment conducted on farm met dairy farmer expectations as well as monitoring assessor activities. It also provided some baseline data on awareness of where energy is used in dairies and where energy use efficiency can be changed.

- Component 2: Feedback from dairy farms following receipt of their Energy Efficiency Plan in both Phase 1 and Phase 2 of the program (referred to in report as Post Plan sample).

The second evaluation component explored the impact of the Energy Efficiency Plan in terms of increasing dairy farmer knowledge of where energy is used in the dairy and where efficiencies can be made. It also reviewed the process of having the Plan developed and whether this met people's needs or whether there were some aspects which could have been handled better.

- Component 3: Feedback from dairy farms one year after receiving their Energy Efficiency Plan in both Phase 1 and Phase 2 of the program (referred to in report as 1 Yr Later Sample).

The final evaluation component aimed to fully measure the impact of Smarter Energy Use Program by contacting dairy farmers one year after receiving their plan to determine if they had implemented changes on farm to reduce energy consumption. It also provided an opportunity to check whether knowledge gained by having an assessment conducted for the farm was retained.

The monitoring and evaluation plan included both formative and summative data to ensure the program roll out could be modified as required as well as capturing learnings to inform future programs. It was consistent across both phases of the program.

## Methodology

Post Assessment sample:

A total of 33 interviews with dairy farmers among the first to enrol in the Smarter Energy Use program were conducted to explore their perceptions of dealing with an energy assessor to determine whether this process needed reviewing.

Interviews for this component were carried out by program co-ordinators, with most obtaining 1 or 2 interviews per assessor. Interviews were conducted via telephone between January and May 2013, using a structured questionnaire (see Appendix 1).

Post Plan sample:

Interviews for this component were conducted by Down To Earth Research (DTER) consultants. In total 79 interviews were achieved. All interviews were conducted via telephone between February and May 2013 for Phase 1 and between April and October 2014, using a structured questionnaire (see Appendix 2).

1 Year Later sample:

This component consisted of a further 80 interviews with dairy farmers 1 year after receiving their Energy Efficiency Plans. Interviews were conducted via telephone by DTER consultants between February and March 2014 for Phase 1 and between February and March 2015 for Phase 2. A structured questionnaire was also used for this component (see Appendix 3).

Sample selection:

Dairy farmers were selected randomly from the pool available for each phase and stage. Only one dairy farmer contacted refused to assist with the evaluation – all others gave their time freely and willingly, providing considered response to all questions asked.

## 2. Sample demographics

### 2.1 Age

age	% mentioning (base: all respondents)								
	total (n=192)	nth vic (n=32)	west vic (n=35)	gipps (n=21)*	nsw (n=9)*	qld (n=26)*	sa (n=25)*	wa (n=16)*	tas (n=28)*
18-39	23%	19%	26%	24%	11%	27%	20%	31%	21%
40-56	55%	59%	63%	52%	56%	42%	48%	56%	61%
56+	21%	22%	11%	24%	33%	27%	32%	13%	18%
Average age (years)	48	49	46	48	53	47	50	44	46

### 2.2 Gender

gender	% mentioning (base: all respondents)								
	total (n=192)	nth vic (n=32)	west vic (n=35)	gipps (n=21)*	nsw (n=9)*	qld (n=26)*	sa (n=25)*	wa (n=16)*	tas (n=28)*
Male	90%	88%	89%	95%	100%	92%	100%	100%	71%
Female	10%	13%	11%	5%	0%	8%	0%	0%	29%

### 2.3 Dairy enterprise phase

farm phase	% mentioning (base: all respondents)								
	total (n=192)	nth vic (n=32)	west vic (n=35)	gipps (n=21)*	nsw (n=9)*	qld (n=26)*	sa (n=25)*	wa (n=16)*	tas (n=28)*
Expansion	34%	38%	34%	19%	11%	15%	36%	63%	50%
Steady, where want to be	35%	25%	49%	57%	44%	38%	40%	13%	18%
Steady, unable to expand	24%	25%	17%	24%	22%	42%	16%	25%	25%
Winding down	6%	13%	0%	0%	22%	4%	8%	0%	7%

### 2.4 Herd Size

herd size	% mentioning (base: all respondents)								
	total (n=192)	nth vic (n=32)	west vic (n=35)	gipps (n=21)*	nsw (n=9)*	qld (n=26)*	sa (n=25)*	wa (n=16)*	tas (n=28)*
Small (<150 cows)	11%	16%	6%	5%	11%	19%	16%	6%	7%
Medium (150-300)	46%	47%	37%	60%	67%	65%	44%	56%	18%
Large (301-500)	29%	38%	37%	25%	22%	4%	20%	25%	50%
X-Large (501-700)	8%	0%	14%	10%	0%	8%	8%	13%	11%
XX-Large (700+)	5%	0%	6%	0%	0%	4%	12%	0%	14%
Average herd size	360	271	377	300	230	250	459	349	548

### 2.5 Milking frequency

milking frequency	% mentioning (base: all respondents)								
	total (n=192)	nth vic (n=32)	west vic (n=35)	gipps (n=21)*	nsw (n=9)*	qld (n=26)*	sa (n=25)*	wa (n=16)*	tas (n=28)*
Once a day	1%	0%	3%	0%	0%	0%	0%	0%	0%
Twice a day	98%	100%	97%	100%	89%	100%	96%	100%	100%
Three times a day	1%	0%	0%	0%	11%	0%	4%	0%	0%

### 2.6 Dairy type

dairy type	% mentioning (base: all respondents)								
	total (n=192)	nth vic (n=32)	west vic (n=35)	gipps (n=21)*	nsw (n=9)*	qld (n=26)*	sa (n=25)*	wa (n=16)*	tas (n=28)*
Rotary	27%	19%	57%	24%	0%	0%	32%	25%	29%
Herringbone	50%	38%	37%	48%	67%	77%	56%	56%	43%
Swing over	20%	44%	3%	29%	11%	19%	12%	0%	29%
Other	4%	0%	3%	0%	22%	4%	0%	19%	0%

\*Caution: very small sample sizes. Data included for interest only. Errors due to rounding.

## Results

- Dairy farmers participating in the Smarter Energy Use program are slightly younger (48 years) than the 'average' dairy farmer (52 years) and are more likely to be in an expansion phase when compared to National Dairy Farmer Survey 2014 data (34% compared to 23%).
- Additionally, average herd size on participant farms is substantially larger than the national average (360 milking cows versus 304).
- Almost all respondents milk twice a day, in a variety of shed types.

### 3. Overall impact of Smarter Energy Use program

#### 3.1 Impact on energy use awareness and knowledge

Questions asked:

- Q. Prior to having an energy assessment conducted, how would you have rated your knowledge on a scale of 0 to 10 where 0 equals 'no knowledge' and 10 equals 'know everything there is to know' about the following ...
- Q. Now that you have had an energy efficiency assessment conducted, how would you rate your knowledge on a scale of 0 to 10 where 0 equals 'no knowledge' and 10 equals 'know everything there is to know' about the following ...

#### Results for total sample of program participants (Phase 1 + Phase 2):

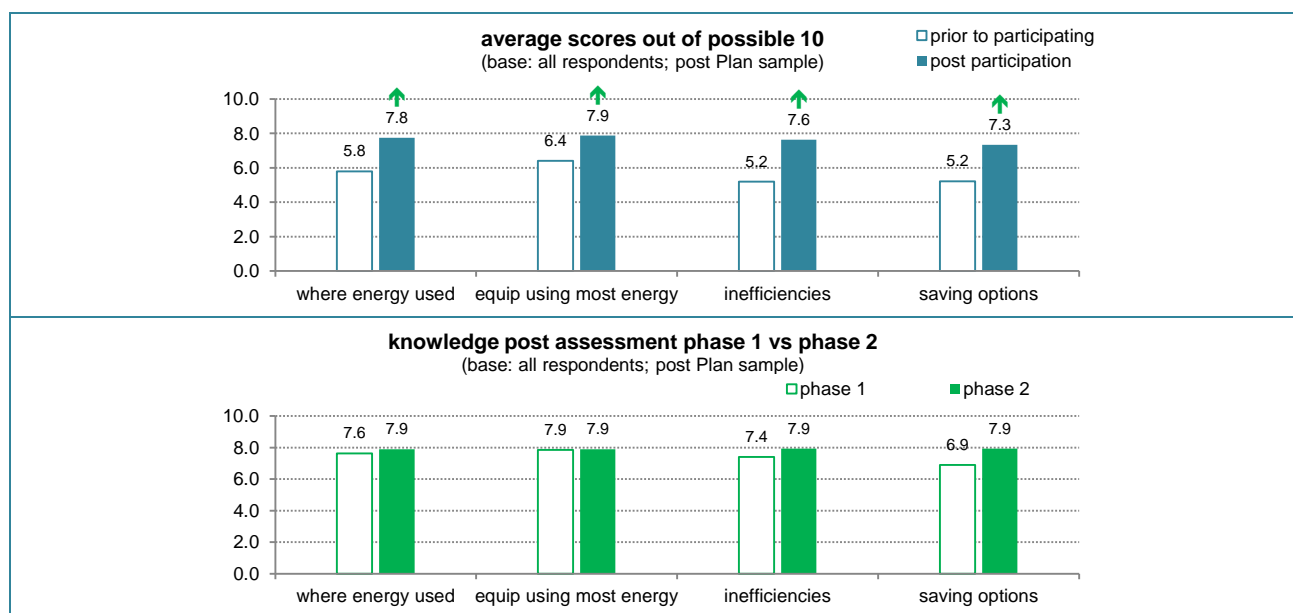
knowledge area	average score out of a possible 10 (base: all respondents; post Plan sample)								
	total (n=79)	nth vic (n=13)*	west vic (n=14)*	gipps (n=9)*	nsw (n=5)*	qld (n=11)*	sa (n=11)*	wa (n=5)*	tas (n=11)*
<b>Pre assessment:</b>									
Where energy is used in dairy	5.8	5.4	5.9	6.4	6.6	5.9	5.9	4.8	5.4
Equipment using most energy in dairy	6.4	6.8	6.6	7.0	7.8	5.8	6.1	5.6	5.7
Potential energy inefficiencies in dairy	5.2	5.5	5.8	5.8	5.8	4.4	5.0	4.8	4.3
Energy saving options available for dairy and farm	5.2	5.5	5.4	5.6	5.6	4.6	5.6	5.4	4.2
<b>Post assessment:</b>									
Where energy is used in dairy	↑ 7.7	7.9	7.8	8.0	8.2	8.1	7.0	7.8	7.5
Equipment using most energy in dairy	↑ 7.9	7.4	8.2	8.8	8.6	7.7	7.1	8.0	7.7
Potential energy inefficiencies in dairy	↑ 7.6	7.5	7.8	7.9	8.6	7.4	7.1	8.2	7.4
Energy saving options available for dairy and farm	↑ 7.3	7.0	8.1	7.0	8.4	7.4	6.0	8.0	7.4

\*Caution: very small sample sizes. Data included for interest only. ↑ statistically significant increase compared to pre assessment

#### Comparison of results between Phase 1 and Phase 2 of the program:

knowledge area	average score out of a possible 10 (base: all respondents)	
	phase 1 (n = 49)	phase 2 (n=30)
<b>Pre assessment:</b>		
Where energy is used in dairy	5.7	6.0
Equipment using most energy in dairy	6.4	6.4
Potential energy inefficiencies in dairy	5.1	5.3
Energy saving options available for dairy and farm	5.0	5.4
<b>Post assessment:</b>		
Where energy is used in dairy	7.6	7.9
Equipment using most energy in dairy	7.9	7.9
Potential energy inefficiencies in dairy	7.4	7.9
Energy saving options available for dairy and farm	6.9	7.9

\*Caution: very small sample sizes. Data included for interest only.



↑ statistically significant increase compared to pre assessment

## Results

- Having an Energy Assessment conducted on farm and subsequently receiving an Energy Efficiency Plan has resulted in substantial gains in self rated knowledge in 4 key areas tested.
- The average increases recorded are as follows:
  - *Where energy is used in the dairy:* up significantly from an average 5.8 points prior to participating in the program to 7.7 points following participation
  - *Which equipment uses the most energy in the dairy:* up significantly from 6.4 points to 7.9 points
  - *Where there can potentially be energy inefficiencies in the dairy:* up significantly from 5.2 points to 7.6 points
  - *Energy saving options available for the dairy and the farm:* up significantly from 5.2 points to 7.3 points
- Of note, the average knowledge rating post assessment for Phase 2 was slightly higher than Phase 1 for each measure.

## Implications

Participating in the Smarter Energy Use program has had a substantial impact on dairy farmer knowledge and awareness of where energy is used in the dairy and potential areas of inefficiency. It has also facilitated greater awareness of energy saving options available.

The formative evaluation components from Phase 1 identified that some of the energy assessors used for the program were better at communicating with dairy farmers than others. Dairy Australia responded to this finding by being selective in the structure of the assessment team for Phase 2 and clearly this decision has had a positive impact on outcomes of the program.

## 3.2 Knowledge gained through receiving energy efficiency plan

Questions asked:

Q. Did you learn anything new from the Energy Efficiency Plan?

Q. If yes: What did you learn?

### Results for total sample of program participants (Phase 1 + Phase 2):

knowledge gained (main mentions)	% mentioning (base: all respondents post Plan sample)								
	total (n=79)	nth vic (n=13)*	west vic (n=14)*	gipps (n=9)*	nsw (n=5)*	qld (n=11)*	sa (n=11)*	wa (n=5)*	tas (n=11)*
Learnt something from the Plan	96%	92%	100%	89%	100%	91%	100%	100%	100%
Milk cooling efficiency	39%	46%	29%	44%	20%	18%	36%	40%	73%
Areas to improve energy efficiency	30%	8%	29%	22%	60%	36%	27%	60%	36%
Hot water efficiency	30%	8%	29%	22%	40%	27%	45%	20%	55%
Benchmark of energy use	28%	38%	43%	11%	20%	9%	36%	80%	0%
Where power is used	18%	15%	36%	11%	0%	0%	9%	0%	45%
Payback times/energy use rankings	13%	0%	21%	11%	0%	18%	18%	40%	0%
Cheaper electricity rates possible	11%	0%	21%	0%	0%	27%	9%	20%	9%
Lighting use efficiency	10%	0%	7%	11%	0%	18%	18%	20%	9%
Vacuum pump efficiency	8%	0%	14%	0%	0%	9%	18%	0%	9%

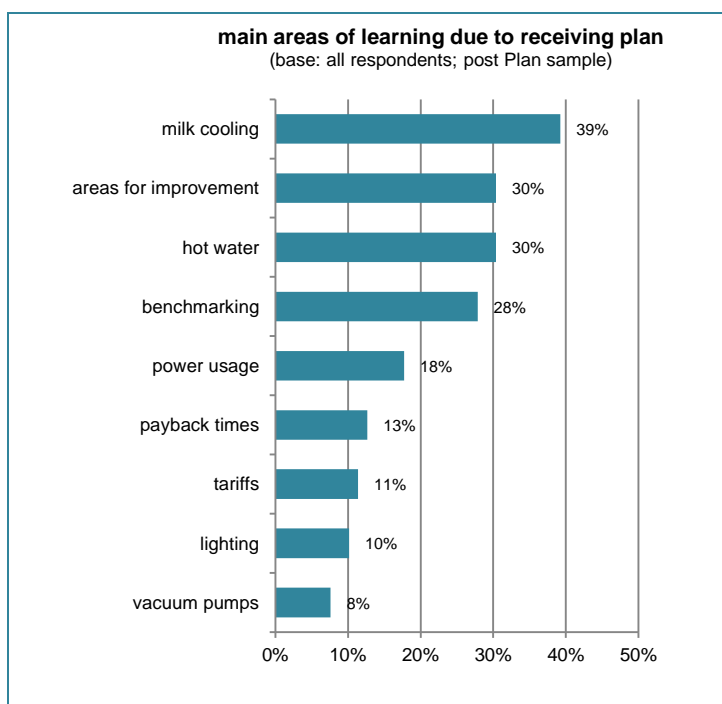
\*Caution: very small sample sizes. Data included for interest only.

### Comparison of results between Phase 1 and Phase 2 of the program:

knowledge gained (main mentions)	% mentioning (base: all respondents; post Plan sample)	
	phase 1 (n = 49)	phase 2 (n=30)
Learnt something from the Plan	94%	100%
Milk cooling efficiency	39%	40%
Areas to improve energy efficiency	22%	43%
Hot water efficiency	27%	37%
Benchmarking of energy use	33%	20%
Where power is used	14%	23%
Payback times/energy use rankings	18%	3%
Cheaper electricity rates possible	18%	10%
Lighting use efficiency	10%	10%
Vacuum pump efficiency	12%	17%

\*Caution: very small sample sizes. Data included for interest only.

⬆️ statistically significant increase since Phase 1



## Results

- Almost all the dairy farmers interviewed believe they learnt something through participating in the Smarter Energy Use Program.
- On average, respondents mentioned 2 areas of learning due to the program. Typically, knowledge has been gained in the areas of identifying how to improve milk cooling (39%), energy efficiency (30%) as well as milk cooling (30%) and how their dairy's performance compares to benchmarks (28%).

*"I had a problem with the hot water thermostat. I had noticed a spike in the electricity bill in the last eight months and I knew something was wrong, so I got the electrician out and he said everything was wired correctly, but it wasn't until Chris came out and noticed there was a problem with the thermostat that we realized the water had been boiling for 24/7 the last eight months!"*

*"I learnt there were four or five ways I could save energy. These options were also put in order as to which would save the most energy and there were costings for each aspect, so it highlighted which ones to do first."*

- Some respondents mentioned the value of benchmarking with other local dairies (28% mentioning):

*"We thought we would be above average in terms of power use, but we were actually just below the district average. Learning that made us look at the time things were running and how we could improve."*
- Other areas of learning included:
  - Energy usage of equipment within the dairy (18% of respondents mentioning)
  - Information on supplier tariffs (11%)
  - Options for energy efficient lighting (10%)
  - Knowledge of variable speed drives and efficiency of vacuum pumps (8%)

## Implications

One of the key aims of the Smarter Energy Use program was to create awareness of power used by dairy equipment and the potential for reduction or savings. Clearly this aim has been achieved and program participants have a better understanding of what can be done in their dairy and how best to prioritise future undertakings.

### 3.3 How knowledge will assist in future

Question asked:

Q. How is that knowledge likely to help you in future, if at all?

#### Results for total sample of program participants (Phase 1 + Phase 2):

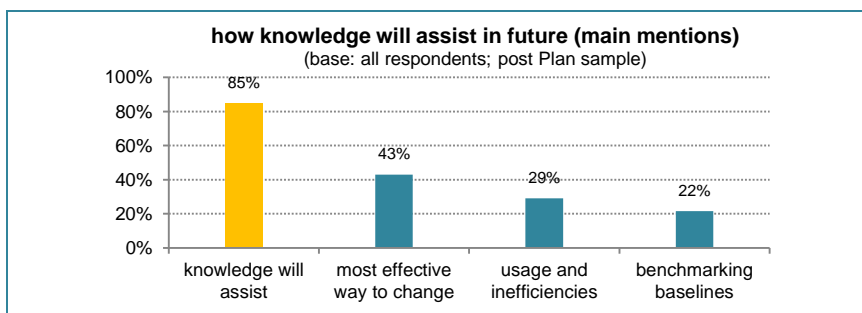
how knowledge will assist in the future (main mentions)	% mentioning (base: all respondents post Plan sample)								
	total (n=79)	nth vic (n=13)*	west vic (n=14)*	gipps (n=9)*	nsw (n=5)*	qld (n=11)*	sa (n=11)*	wa (n=5)*	tas (n=11)*
Believe knowledge will assist in future	85%	77%	93%	50%	100%	73%	91%	100%	100%
Know most effective way to make changes	46%	15%	71%	13%	20%	64%	36%	80%	64%
Have increased knowledge of usage and inefficiencies	29%	23%	21%	25%	40%	18%	45%	60%	27%
Have benchmark data for comparison	24%	38%	29%	13%	40%	0%	18%	40%	27%

\*Caution: very small sample sizes. Data included for interest only.

#### Comparison of results between Phase 1 and Phase 2 of the program:

how knowledge will assist in the future (main mentions)	% mentioning (base: all respondents; post Plan sample)	
	phase 1 (n=49)	phase 2 (n=30)
Believe knowledge will assist in future	80%	93%
Know most effective way to make changes	43%	43%
Have increased knowledge of usage and inefficiencies	31%	27%
Have benchmark data for comparison	24%	17%

\*Caution: very small sample sizes. Data included for interest only.





## Results

- A very high 85% of evaluation respondents believe knowledge gained through program participation will assist them in future.
- Forty-three percent (43%) of the dairy farmers interviewed believe they now have a clearer understanding of changes they could make to improve energy efficiency in future:

*"The whole process has helped me think about and plan a lot of changes and I now feel confident that the changes I make in the future will be worthwhile."*

*"If we ever have to replace anything in the dairy, we will take into consideration what we learnt through the assessment and use the plan as a guide for what equipment is best to purchase."*

- Increased knowledge of usage and inefficiencies was mentioned by 29% of respondents, with comments similar to the following made:

*"We just need to keep following up on equipment that may be inefficient in the future, things like temperatures and making sure that thermostats and thermometers are working effectively."*

*"Sometimes the staff don't realize they are doing something which uses a lot of energy and that is where the Plan helps – by showing them they were leaving a large pump running for the whole milking when it didn't need to be."*

- Interest in benchmarking is also evident, with comments similar to the following made by 22% of respondents:

*"It was interesting to look at how I was going compared to other farms and the where I can to make improvements to be better than average."*

*"It give us a base to work from later on so we can look at things and say that's what we were doing five years ago and if it has gone up, we can investigate why."*

## Implications

Clearly the program has provided knowledge that will benefit dairy farmers both now and in the future. Evaluation results reveal the program has assisted dairy farmers to be more vigilant about their energy consumption and to plan changes likely to have the greatest impact.

### 3.4 Impact on decision making

Questions asked:

Q. Over the past year, have you referred to your Energy Efficiency Plan other than to read through it when you first received it?

Q. Have you made any changes as a result of recommendations made in the Energy Efficiency Plan you received?

Q. If purchased new equipment or new lighting: did information gained through the assessment assist you in any way to make decisions about the equipment/lighting purchased? If yes: In what way?

#### Results for total sample of program participants (Phase 1 + Phase 2):

impact	% mentioning (base: all respondents 1 yr later sample)								
	total (n=80)	nth vic (n=14)*	west vic (n=14)*	gipps (n=8)*	nsw (n=4)*	qld (n=10)*	sa (n=10)*	wa (n=9)*	tas (n=11)*
Referred back to plan	53%	36%	43%	63%	75%	50%	60%	56%	64%
Will refer to plan prior to making change	20%	21%	36%	25%	25%	10%	30%	11%	0%
Remember recommendations so have not referred back to plan	5%	7%	0%	13%	0%	0%	0%	22%	0%
Not referred to plan	24%	36%	21%	25%	0%	40%	10%	0%	36%

Errors due to rounding

audit assisted equipment purchase	% mentioning (base: all 1 yr later sample)
	total (n=26)*
Plan assisted purchase of equipment	96%
Considered the efficiency of equipment	92%
Purchased equipment that uses heat recovery/solar etc	44%

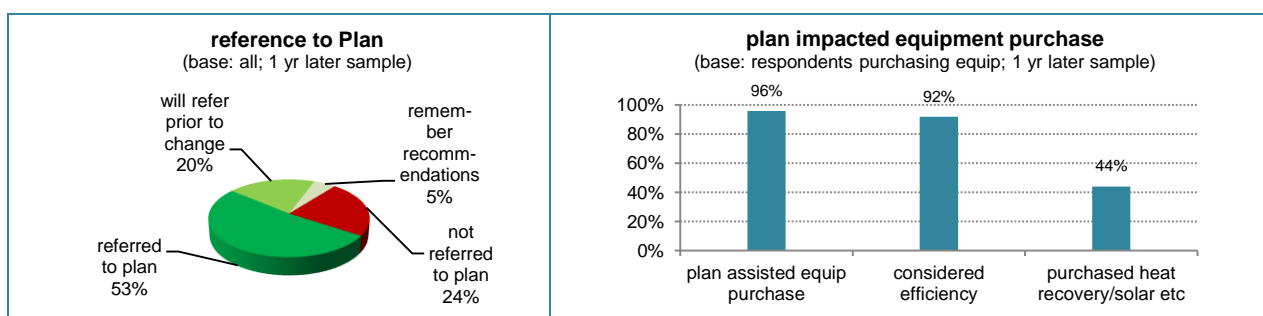
\*Caution: very small sample sizes. Data included for interest only.

#### Comparison of results between Phase 1 and Phase 2 of the program:

impact	% mentioning (base: all respondents 1 yr later sample)	
	phase 1 (n=50)	phase 2 (n=30)
Referred back to plan	54%	50%
Will refer to plan prior to making change	20%	20%
Remember recommendations so have not referred back to plan	8%	0%
Not referred to plan	18%	30%

audit assisted equipment purchase	% mentioning (base: purchased equipment 1 yr later sample)	
	phase 1 (n=16)*	phase 2 (n=10)*
Plan assisted purchase of equipment	94%	100%
Considered the efficiency of equipment	88%	97%
Purchased equipment that uses heat recovery/solar etc	38%	50%

\*Caution: very small sample sizes. Data included for interest only. Errors due to rounding



## Results

- In the year since receiving their Energy Efficiency Plan, half of the dairy farmers interviewed (53%) said they have referred back to it, typically to refresh their memory on recommendations made.
- One in 5 respondents (20%) have not referred back to their Plan over the past year but intend to do so prior to making changes planned for the future.
- Others have not re-read their Plan, mainly due to remembering its contents. Notably, 2 of this group said their Plan did not recommend making any changes and consequently there was no need to refer back to it.
- In the year following the energy audit, 33% of the dairy farmers interviewed bought new equipment for the dairy and almost all this group considered energy efficiency prior to purchase and several looked into equipment that uses heat recovery systems or alternate power.

## Implications

Energy Efficiency Plans developed for individual farms are being used as a reference and are having an impact on farmer decision making and purchases, both in the longer and shorter term.

### 3.5 Changes made as result of Smarter Energy Use program

Questions asked:

Q. Did the Energy Efficiency Plan you received make any recommendations similar to the following?

Q. Have you made any changes as a result of recommendations made in the Energy Efficiency Plan you received?

Q. If yes: What have you changed?

Q. If no changes made or not all recommended changes made: Do you plan to make any changes/any further changes as a result of those recommendations or are there changes/further changes you would like to make but probably won't be able to?

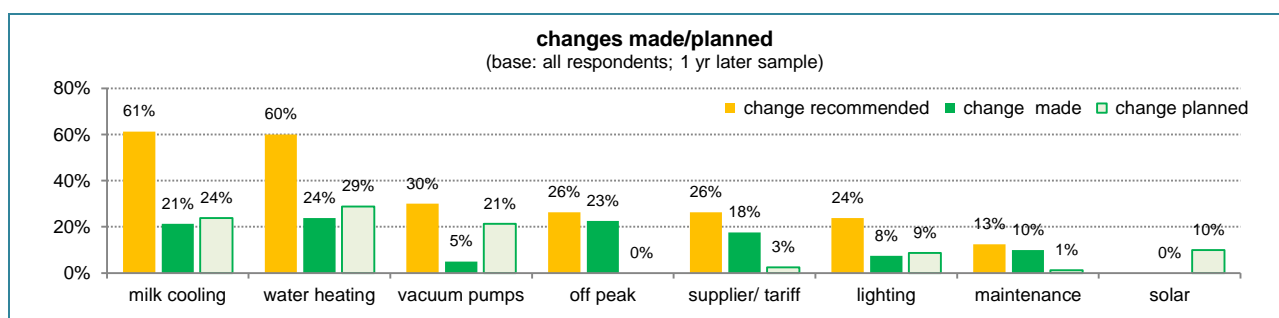
Q. If yes: What changes do you have planned or would you like to make?

#### Results for total sample of program participants (Phase 1 + Phase 2):

changes recommended/implemented/ planned	% mentioning (base: all respondents 1 yr later sample)								
	total (n=80)	nth vic (n=14)*	west vic (n=14)*	gipps (n=8)*	nsw (n=4)*	qld (n=10)*	sa (n=10)*	wa (n=9)*	tas (n=11)*
<b>Milk cooling system:</b>									
Change recommended in Plan	61%	71%	57%	63%	75%	50%	60%	44%	73%
Change already made	21%	21%	7%	25%	0%	10%	20%	22%	55%
Change planned for future	24%	29%	36%	38%	0%	20%	20%	11%	18%
<b>Water heating system:</b>									
Change recommended in Plan	60%	36%	79%	50%	50%	80%	60%	44%	73%
Change already made	24%	29%	21%	25%	25%	30%	10%	0%	45%
Change planned for future	29%	14%	50%	25%	25%	20%	50%	33%	9%
<b>Vacuum pumps:</b>									
Change recommended in Plan	30%	21%	36%	38%	75%	20%	40%	22%	18%
Change already made	5%	0%	14%	13%	0%	0%	0%	0%	9%
Change planned for future	21%	14%	29%	13%	25%	30%	30%	22%	9%
<b>Change energy supplier/tariffs</b>									
Change recommended in Plan	26%	21%	36%	0%	25%	40%	40%	11%	27%
Change already made	18%	14%	21%	0%	25%	20%	20%	11%	27%
Change planned for future	3%	0%	7%	0%	0%	10%	0%	0%	0%
<b>Lighting:</b>									
Change recommended in Plan	24%	7%	29%	25%	50%	20%	40%	33%	9%
Change already made	8%	0%	7%	0%	25%	10%	20%	11%	0%
Change planned for future	9%	7%	14%	13%	0%	10%	0%	22%	0%
<b>Increase off peak electricity use:</b>									
Change recommended in Plan	26%	7%	36%	25%	25%	20%	40%	33%	27%
Change already made	23%	7%	29%	25%	0%	20%	40%	33%	18%
Change planned for future	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Increase equipment maintenance:</b>									
Change recommended in Plan	13%	0%	21%	0%	0%	0%	40%	11%	18%
Change already made	10%	0%	21%	0%	0%	0%	20%	11%	18%
Change planned for future	1%	0%	0%	0%	0%	0%	10%	0%	0%
<b>Solar:</b>									
Change already made	1%	0%	7%	0%	0%	0%	0%	0%	0%
Change planned for future	8%	21%	7%	0%	0%	0%	0%	11%	9%
Total: already made changes†	66%	50%	79%	63%	75%	50%	90%	56%	73%
Total: plan to make changes†	63%	64%	71%	50%	50%	60%	80%	56%	55%

\*Caution: very small sample sizes. Data included for interest only.

†Some respondents have made or plan to make changes in more than 1 area.



## Results

- Energy Efficiency Plans included recommendations for reducing power consumption in all except for two respondent dairies. The most common recommendations are as follows:
  - Milk cooling, including installation of more efficient equipment, using cooler water sources, etc (recommended in 61% of dairies)
  - Water heating, including installation of more efficient equipment, lowering water temperatures where possible, using heat exchange units, etc (60%)
  - Vacuum pumps, including installation of more efficient equipment (30%)
  - Lighting, including changing to more efficient globes, etc (24%)
- Additionally, assessors were able to make cost saving recommendations on several farms, namely:
  - Negotiation of tariffs/change of energy supplier for better rates (26% of respondent farms)
  - Using more off-peak electricity (26%)
- At least some of the recommended changes have been implemented by 66% of the dairy farmers interviewed and 63% plan to make changes in the future (some have made changes and plan to make others). Main areas of change are as follows:
  - Water heating (24% already making change, 29% planning to in future)
  - Using more off peak power (23% making change)
  - Milk cooling (21% making change, 24% planning to)
  - Changing energy supplier or tariff (18% making change; 3% planning to)
  - Increasing equipment maintenance (10% making change; 1% planning to)
  - Lighting (8% making change, 9% planning to)
  - Vacuum pumps (5% making change, 21% planning to)

## Implications

Having an Energy Assessment conducted on farm has resulted in changes being made or planned for that will ultimately reduce the amount of energy consumed. Some of the changes made have been relatively minor, such as sourcing cooler water to run through plate coolers, while others have meant significant investment such as purchasing new equipment.

### 3.6 Barriers to making changes

Questions asked:

Q. If changes planned or would like to make in future: What has prevented you from making changes?

Q. If no changes made or planned: Are there any reasons why you won't make the changes recommended?

Q. What sort of support, if any, would you need to implement changes?

#### Results for total sample of program participants (Phase 1 + Phase 2):

barriers to change/ support required to make changes (main mentions)	% mentioning (base: respondents not making recommended changes; 1 yr later sample)									
	total (n=65)	nth vic (n=11)*	west vic (n=12)*	gipps (n=4)*	nsw (n=3)*	qld (n=10)*	sa (n=10)*	wa (n=6)*	tas (n=9)*	
Cost/unable to afford	55%	45%	67%	75%	100%	40%	70%	67%	22%	
Existing equipment still working	31%	27%	50%	50%	0%	30%	20%	33%	22%	
Don't believe change will affect consumption	20%	18%	17%	0%	0%	40%	0%	0%	56%	
Payback time too long/unrealistic	5%	0%	0%	0%	0%	10%	0%	0%	22%	
Grants/financial assistance	25%	9%	17%	0%	67%	40%	40%	17%	22%	
Checklist/costs for purchasing equipment	11%	9%	8%	50%	0%	10%	10%	17%	0%	
Better return on solar power contributions to the grid	5%	0%	8%	0%	0%	10%	0%	17%	0%	
Bulk purchase of electricity	2%	0%	0%	0%	0%	11%	0%	0%	0%	
Nothing further required/don't know	62%	73%	75%	50%	33%	40%	50%	33%	78%	

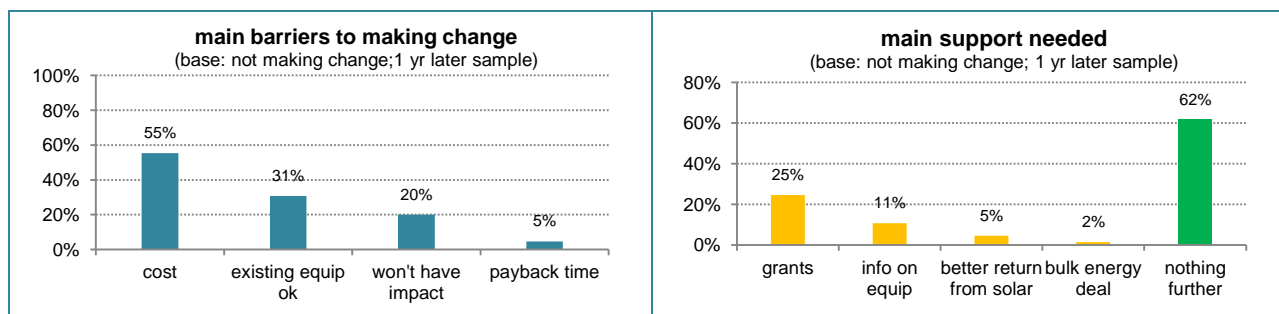
\*Caution: very small sample sizes. Data included for interest only.

#### Comparison of results between Phase 1 and Phase 2 of the program:

barriers to change/ support required to make changes (main mentions)	% mentioning (base: respondents not making recommended changes; 1 yr later sample)	
	phase 1 (n=38)	phase 2 (n=27)
Cost/unable to afford	53%	59%
Existing equipment still working	39%	17%
Don't believe change will affect consumption	21%	17%
Payback time too long/unrealistic	8%	0%
Grants/financial assistance	26%	22%
Checklist/costs for purchasing equipment	16%	4%
Better return on solar power contributions to the grid	8%	0%
Bulk purchase of electricity	3%	0%
Nothing further required/don't know	65%	70%

\*Caution: very small sample sizes. Data included for interest only.

📈 statistically significant increase since Phase 1



## Results

- The cost of making changes has proven to be the main barrier to change (mentioned by 55% of respondents yet to make all recommended changes).
- In 2013, farm gate milk price was comparatively low and it was reasonable to expect the increases in farm gate milk price seen during 2014 would result in a significant decline in the proportion of Phase 2 program participants saying they have been able to make changes within a year due to prohibitive costs. This has not been the case however.
- Approximately one third of respondents who have not made all the changes recommended (31%) mentioned that equipment identified as inefficient will be replaced, but only when it fails:  
*"The Plan showed the water heater we have is really inefficient but it is still working and I don't plan on replacing it until it breaks down. When it does break down though, I will certainly look at purchasing a more efficient heater."*
- There are some respondents (20% of those not making all recommended changes) who believe suggestions made by assessors will have little or no impact on energy consumption in the dairy and consequently will not justify the initial financial outlay required.
- The most common form of support required by respondents not yet making all the recommended changes to their dairy is financial (grants mentioned by 25%), but some (12%) said it would be helpful to receive additional information on the most suitable type of equipment for their situation:  
*"It would be good to have some sort of checklist of things to look for when you are buying equipment – things like the size of equipment that would be the most efficient in your situation."*

## Implications

Barriers to change are typically linked to affordability and the fact current equipment is still functioning. This finding validates comments made by respondents that as equipment breaks down or when budget allows, changes to more energy efficient options will occur.

While providing grants would no doubt encourage faster replacement of equipment, there is no pressing need to consider this option based on evaluation findings.

### 3.7 Impact of changes made on energy consumption

Questions asked:

Q. Have these changes substantially reduced power consumption, slightly reduced power consumption or not changed power consumption at all?

Q. How satisfied are you with this change in power consumption/the fact power consumption hasn't altered?

#### Results for total sample of program participants (Phase 1 + Phase 2):

impact on energy consumption	% mentioning (base: made at least some changes; 1 year later sample)								
	total (n=53)	nth vic (n=7)*	west vic (n=11)*	gipps (n=5)*	nsw (n=3)*	qld (n=5)*	sa (n=8)*	wa (n=5)*	tas (n=9)*
Substantially reduced	13%	0%	18%	0%	0%	40%	11%	0%	25%
Slightly reduced	26%	14%	27%	40%	33%	40%	22%	40%	13%
Not changed power consumption	4%	0%	0%	0%	67%	0%	0%	0%	0%
Can't tell yet	57%	86%	55%	60%	0%	20%	67%	60%	67%
Total: consumption reduced	40%	14%	45%	40%	33%	80%	33%	40%	33%

\*Caution: very small sample sizes. Data included for interest only. Errors due to rounding.

satisfaction with impact	% mentioning (base: able to judge change in power consumption; 1 year later sample)								
	total (n=23)*	nth vic (n=1)*	west vic (n=5)*	gipps (n=2)*	nsw (n=3)*	qld (n=4)*	sa (n=3)*	wa (n=1)*	tas (n=4)*
Very satisfied	30%	0%	20%	50%	0%	75%	0%	0%	67%
Fairly satisfied	70%	100%	80%	50%	100%	25%	100%	100%	33%
Not too satisfied	0%	0%	0%	0%	0%	0%	0%	0%	0%
Not satisfied at all	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total: satisfied	100%	100%	100%	100%	100%	100%	100%	100%	100%

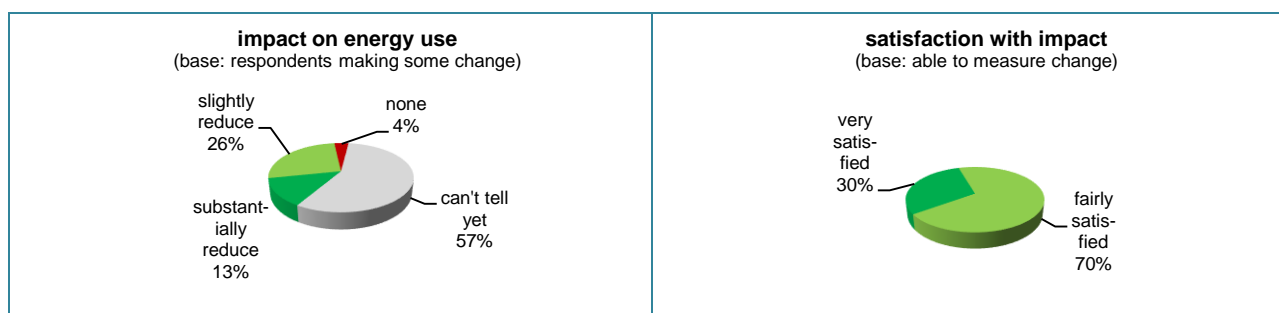
\*Caution: very small sample sizes. Data included for interest only.

#### Comparison of results between Phase 1 and Phase 2 of the program:

impact on energy consumption	% mentioning (base: made at least some changes; 1 year later sample)		satisfaction with impact	% mentioning (base: able to judge change in power consumption; 1 year later sample)	
	phase 1 (n=31)	phase 2 (n=22)		phase 1 (n=9)*	phase 2 (n=14)
Substantially reduced	3%	27%	Very satisfied	33%	29%
Slightly reduced	26%	27%	Fairly satisfied	67%	71%
Not changed power consumption	0%	9%	Not too satisfied	0%	0%
Can't tell yet	71%	36%	Not satisfied at all	0%	0%
Total: consumption reduced	29%	↑ 54%	Total: satisfied	100%	100%

\*Caution: very small sample sizes. Data included for interest only. Errors due to rounding.

↑ statistically significant increase since Phase 1





## Results

- Assessing the impact of changes made in the dairy proved difficult for most respondents, due to the following:
  - Receiving 'estimated' bills from their power supplier rather than having meters read regularly
  - Increases in herd size and/or production since having an energy assessment of their dairy conducted and consequently running machinery for longer periods
  - Variations in weather conditions in some areas impacting power requirements to cool milk and for sprinkler systems and fans etc. to keep animals cool
- In total, only 23 respondents making at least some of the changes recommended in their Energy Efficiency Plan were able to evaluate the subsequent impact on power consumption. All were either fairly (16 respondents) or very satisfied (7 respondents) with the outcome.

## Implications

Results suggest it can be difficult for farmers to accurately measure the impact of installing more energy efficient equipment in the dairy. This finding highlights the importance of using credible assessors in the first instance and (if required) using other more robust means of determining energy consumption prior to and following the installation of new equipment.

### 3.8 Impact on attitudes towards energy consumption

Question asked:

Q. Has the energy audit of your dairy changed your attitude towards energy consumption generally in any way at all? If yes: In what way?

#### Results for total sample of program participants (Phase 1 + Phase 2):

impact on attitude (main mentions)	% mentioning (base: all respondents; 1 year later sample)								
	total (n=80)	nth vic (n=14)*	west vic (n=14)*	gipps (n=8)*	nsw (n=4)*	qld (n=10)*	sa (n=10)*	wa (n=9)*	tas (n=11)*
Assessment changed attitude	79%	86%	79%	50%	75%	90%	70%	100%	73%
Already conscious of energy use	21%	14%	21%	50%	25%	10%	30%	0%	27%
Now more conscious of switching equipment off/decreasing consumption	71%	71%	79%	38%	75%	70%	60%	100%	73%
Energy efficiency will be considered when purchasing equipment	23%	14%	29%	38%	50%	20%	20%	33%	0%
Maintaining/servicing equipment	19%	7%	43%	25%	0%	10%	40%	11%	0%

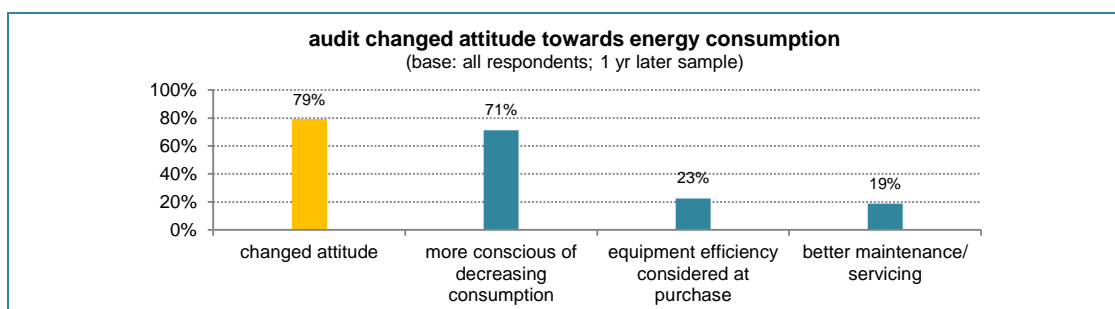
\*Caution: very small sample sizes. Data included for interest only.

#### Comparison of results between Phase 1 and Phase 2 of the program:

Impact (main mentions)	% mentioning (base: all respondents; 1 year later sample)	
	phase 1 (n=50)	phase 2 (n=30)
Assessment changed attitude	80%	79%
Already conscious of energy use	20%	21%
Now more conscious of switching equipment off/decreasing consumption	56%	↑ 92%
Energy efficiency will be considered when purchasing equipment	26%	17%
Maintaining/servicing equipment	30%	↓ 0%

\*Caution: very small sample sizes. Data included for interest only.

↑ statistically significant increase since Phase 1  
 ↓ statistically significant decrease since Phase 1



## Results

- A very high 79% of respondents said that having an energy assessment conducted changed their attitude towards energy consumption. Key changes in attitude are mainly linked to the following areas of focus:
  - Turning off lights and equipment when not in use:

*"We now turn the lights off in the dairy as soon as it is light and we turn the yard lights off when it is light enough to see. We also turn off everything as soon as we leave the dairy - fans, equipment and the like."*

*"We used to leave everything on in the dairy, but the assessment has made us realize there is no point having all these lights blinking at you because machinery is on when no one is using it."*
  - Investigating energy efficiency of equipment before purchasing:

*"Having the assessment conducted has meant that when I was looking for a new water heater I factored in the energy efficiency of the equipment as well rather than just looking at size and cost."*

*"It makes you more aware of energy consumption and I actually was talking with my electrician last week and said to him that anything we do from now on, energy consumption has to be factored in. It's no use telling me to put in 3 phase power or anything like that if it is going to use more power."*
  - Maintaining and servicing equipment:

*"We are now a lot more aware of looking at efficiencies of equipment and making sure we do the maintenance required to keep machines running at their peak efficiency."*
- Respondents saying the assessment has not changed their attitude said this was typically due to already having good awareness of the benefits of saving energy:

*"We have made lots of changes in the past and always tried to minimise the electricity bill and so nothing has changed really. Everything the assessor mentioned we were already aware of and had a good understanding about."*
- For one dairy farmer the assessment gave him the knowledge and confidence to speak to other dairy farmers in regards to options for reducing power consumption:

*"I've been speaking to a number of other dairy farmers about the simple things they can do to save money, which I wouldn't have done without the audit. They have asked me lots of questions about it and some of them have since told me they have made some changes to the dairy and others have said they will do so in future, especially when they have to replace equipment that has broken down."*

## Implications

Attitudinal changes have resulted from program participation – an encouraging finding. While some of the dairy farmers who applied to have an audit conducted had already made a concerted effort to ensure their dairy is as energy efficient as possible, others are now more aware of how energy consumption can be reduced and are active in achieving this.

## 4. Farmer perception of Smarter Energy Use program

### 4.1 Perception of assessment process

Question asked:

Q. How have you found the process of having an energy efficiency assessment conducted for your farm?

#### Results for total sample of program participants (Phase 1 + Phase 2):

perception of assessment process (main mentions)	% mentioning (base: all respondents; post Plan sample)								
	total (n=79)	nth vic (n=13)*	west vic (n=14)*	gipps (n=9)*	nsw (n=5)*	qld (n=11)*	sa (n=11)*	wa (n=5)*	tas (n=11)*
<b>Positive mentions:</b>									
Efficient/not too much paperwork	53%	40%	50%	78%	40%	50%	50%	40%	64%
Good communication with assessor	34%	30%	43%	22%	60%	20%	40%	0%	45%
Interesting/useful process	26%	40%	29%	11%	40%	20%	30%	40%	9%
Assessor assisted with figures	12%	10%	7%	11%	20%	30%	0%	0%	18%
<b>Negative mentions:</b>									
Difficult to collate data required	8%	10%	14%	0%	0%	20%	10%	0%	0%
<b>Neutral mentions:</b>									
Not present during assessment/other	7%	0%	0%	0%	0%	20%	0%	20%	18%

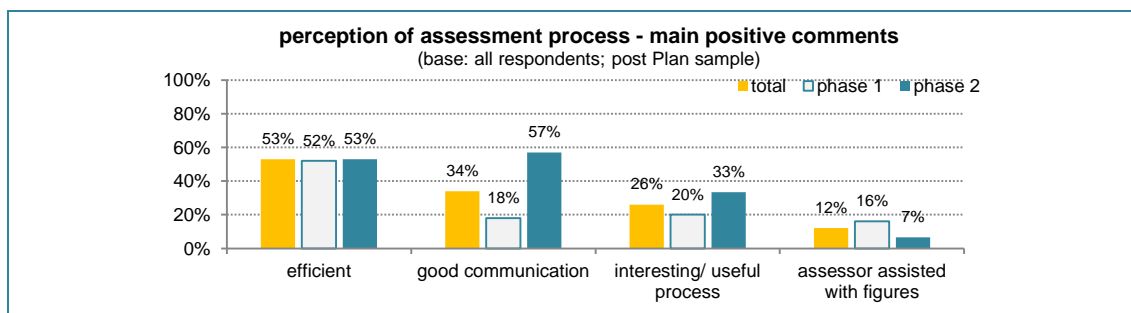
\*Caution: very small sample sizes. Data included for interest only.

#### Comparison of results between Phase 1 and Phase 2 of the program:

perception of assessment process (main mentions)	% mentioning (base: all respondents; post Plan sample)	
	phase 1 (n = 49)	phase 2 (n=30)
<b>Positive mentions:</b>		
Efficient/not too much paperwork	52%	53%
Good communication with assessor	18%	↑ 57%
Interesting/useful process	20%	33%
Assessor assisted with figures	16%	7%
<b>Negative mentions:</b>		
Difficult to collate data required	7%	10%
<b>Neutral mentions:</b>		
Not present during assessment/other	7%	7%

\*Caution: very small sample sizes. Data included for interest only.

↑ statistically significant increase since Phase 1



## Results

- Comments made about the assessment process were almost all positive, although it should be noted that 4 respondents were not actually present when the assessor arrived on their farm.
- In general, the assessment process was deemed to be efficient, with comments similar to the following made:  
*"There really wasn't anything to complain about. It was all done very efficiently and the right questions were asked and it was excellent."*  
*"There wasn't too much paperwork, so it was all pretty easy and efficient."*
- Encouragingly, the proportion of respondents saying (without prompting) that their assessor communicated well rose significantly between Phase 1 and Phase 2 of the program (up from 18% to 57%). Several comments similar to the following were made:  
*"The process was really good. The assessor asked all the right questions and then chased down all our power bills to help us put the figures together. She came back with all the answers I was looking for, so I would have to say the process was really good."*
- The only negative aspect of the assessment process mentioned revolves around the difficulty in collating some of the data required:  
*"Chasing up some of the details of power bills was a bit of an issue for us. The assessor assisted where they could, but because we have a number of accounts, we had to work out which proportion was due to the use in the dairy."*  
*"It was a bit difficult to work out exactly how long some of the equipment runs for in the dairy and I wasn't sure how to work it out. It would have been good to have some help with that."*

## Implications

The assessment process has typically been relatively efficient and interesting for dairy farmers, although a small proportion struggled to provide reliable information on their equipment running times. If similar projects are conducted in future, it may be worth apportioning some budget for additional help for the segment that will require it.

Results for this measure further justify Dairy Australia's decision to use only those energy assessors from Phase 1 shown to have good communication skills for Phase 2 of the program.

## 4.2 Perceived usefulness of energy efficiency plan

Questions asked:

Q. How would you rate the energy efficiency plan in terms of usefulness to you? Have you found it ...

Q. Why do you say that?

### Results for total sample of program participants (Phase 1 + Phase 2):

usefulness of plan/ reasons (main mentions)	% mentioning (base: all respondents; <b>post Plan sample</b> )								
	total (n=79)	nth vic (n=13)*	west vic (n=14)*	gipps (n=9)*	nsw (n=5)*	qld (n=11)*	sa (n=11)*	wa (n=5)*	tas (n=11)*
Very useful	42%	15%	50%	33%	60%	36%	45%	20%	73%
Fairly useful	53%	77%	50%	44%	40%	55%	55%	80%	27%
Not too useful	4%	8%	0%	22%	0%	0%	0%	0%	0%
Not useful at all	1%	0%	0%	0%	0%	9%	0%	0%	0%
Total: useful	95%	92%	100%	78%	100%	91%	100%	100%	100%
Total: not useful	5%	8%	0%	22%	0%	9%	0%	0%	0%
Benchmark/check on farm efficiency	44%	54%	50%	56%	40%	27%	36%	80%	27%
Highlight inefficiencies/areas to focus on	29%	23%	36%	22%	20%	27%	9%	60%	45%
Ideas to save money	23%	8%	14%	11%	60%	27%	18%	20%	45%
Guide for making energy good efficiency decisions in the future	16%	0%	21%	11%	20%	27%	36%	0%	9%
Cost of making changes prohibitive	6%	0%	7%	22%	0%	18%	0%	0%	0%

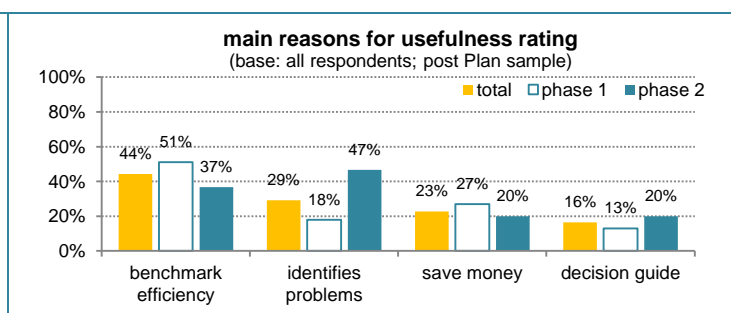
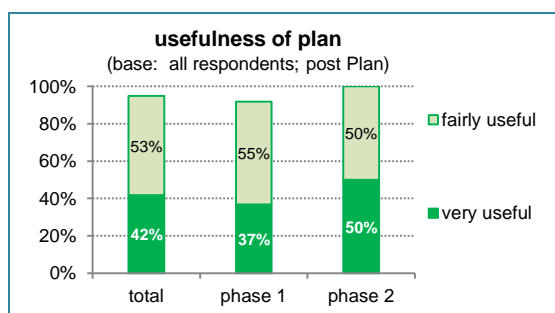
\*Caution: very small sample sizes. Data included for interest only.

### Comparison of results between Phase 1 and Phase 2 of the program:

usefulness of plan/ reasons (main mentions)	% mentioning (base: all respondents; <b>post Plan sample</b> )	
	phase 1 (n = 49)	phase 2 (n=30)
Very useful	37%	50%
Fairly useful	55%	50%
Not too useful	6%	0%
Not useful at all	2%	0%
Total: useful	92%	100%
Total: not useful	8%	0%
Benchmark/check on farm efficiency	49%	37%
Highlight inefficiencies/areas to focus on	18%	↑ 47%
Ideas to save money	24%	20%
Guide for making energy good efficiency decisions in the future	14%	20%
Cost of making changes prohibitive	7%	0%

\*Caution: very small sample sizes. Data included for interest only.

↑ statistically significant increase since Phase 1



## Results

- Almost all respondents rate their Energy Efficiency Plan *fairly* to *very useful*, mainly due to providing benchmark data on power use efficiency:

*"It's been really interesting to compare to other farms that have had assessments done and it makes you realise which areas you are good in and which areas you are not so good in."*

- Having a report that helps prioritise areas to work on is perceived as useful by 29% of respondents, with comments similar to the following made:

*"It highlighted some problem areas in our dairy – areas where there were some inefficiencies and that helps us to work out which areas are the most important for us to focus on first."*

- Approximately 1 in 5 respondents nominate reducing power costs as a useful aspect of the audit. For some, the amount of potential savings are quite small, but for others, the assessment has identified areas where substantial savings can be made:

*"It picked up some problems and showed us how to save some significant money."*

*"It taught me a lot about the little alterations you can make to save a few bob."*

- Several respondents rated the Plan useful due to providing them with information that will guide future decisions when equipment must be replaced:

*"If nothing else it has certainly made me much more aware of where the costs are going and if I did make changes to the dairy in the future – like the hot water service or that sort of thing when it dies – that's the time where you would be really thinking about what you learnt through this program."*

- Four respondents believe the report they received was not useful. This is typically due to concerns over the cost benefit of implementing the changes recommended.

## Implications

Dairy farmers value the data provided in Energy Efficiency Plans due to being able to compare their energy consumption with other farms and identifying cost saving options.

### 4.3 Additional information required

Questions asked:

Q. Is there any additional information you need to help you potentially save energy in future?

Q. If yes: What do you need?

#### Results for total sample of program participants (Phase 1 + Phase 2):

information required (main mentions)	% mentioning (base: all respondents; <b>post Plan sample</b> )								
	total (n=79)	nth vic (n=13)*	west vic (n=14)*	gipps (n=9)*	nsw (n=5)*	qld (n=11)*	sa (n=11)*	wa (n=5)*	tas (n=11)*
Require additional information	42%	31%	29%	56%	20%	45%	45%	60%	55%
Solar/renewable energy	14%	15%	14%	11%	0%	9%	18%	0%	27%
New technologies coming out	10%	8%	14%	22%	0%	0%	18%	20%	0%
Supplier plans	8%	8%	7%	0%	20%	9%	0%	20%	9%
Irrigation power usage	4%	0%	0%	0%	20%	18%	0%	0%	0%
Kilowatts used per cow in comparison to other farms	3%	0%	0%	22%	0%	0%	0%	0%	0%
Sanitiser prices (cold wash)	1%	0%	0%	0%	0%	0%	0%	0%	9%
Meters to monitor usage	1%	0%	0%	0%	0%	0%	9%	0%	0%
Follow up assessment in future	1%	0%	0%	0%	0%	9%	0%	0%	0%

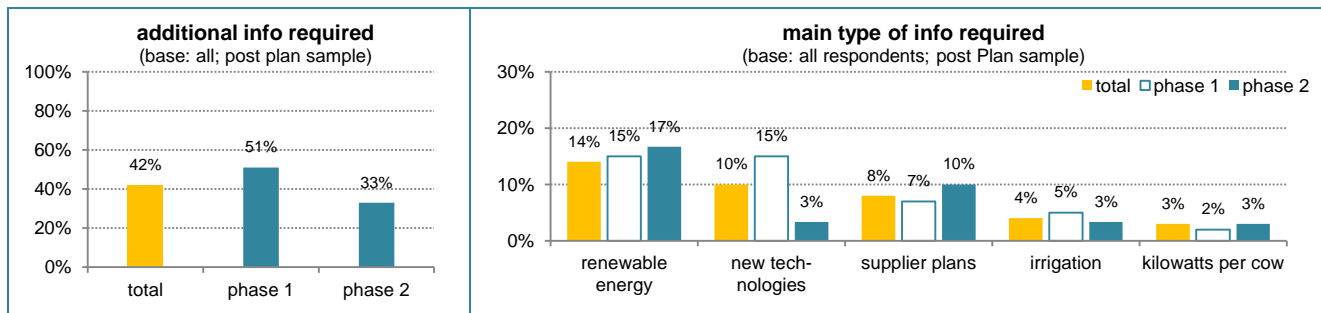
\*Caution: very small sample sizes. Data included for interest only.

#### Comparison of results between Phase 1 and Phase 2 of the program:

information required (main mentions)	% mentioning (base: all respondents; <b>post Plan sample</b> )	
	phase 1 (n=49)	phase 2 (n=30)
Require additional information	51%	33%
Solar/renewable energy	12%	17%
New technologies coming out	14%	3%
Supplier plans	6%	10%
Irrigation power usage	4%	3%
Kilowatts used per cow in comparison to other farms	3%	3%

\*Caution: very small sample sizes. Data included for interest only.

⬆️ statistically significant increase since Phase 1





## Results

- More than half the dairy farmers interviewed said they did not require additional information to help them save energy in the future. Others however are interested in learning more about new technologies and renewable energy options, making comments similar to the following:

*"Keeping up to date with the costings and break-evens of new technologies is always beneficial."*

*"I would have liked some more information on whether or not solar power works – so an evaluation of solar – is it economical given we use half our power in the dark and the feedback tariffs the electricity suppliers are paying when we feed back into the grid."*

- There is also some interest in receiving more information on different electricity tariffs and plans:

*"The assessor mentioned in their report to speak to the electricity suppliers about contestability clauses and I would like to know a bit more about them."*

*"It would be good to have more information on how to find a cheaper energy supplier."*

- A small proportion of respondents are interested in having the efficiency of their irrigation system assessed while others would like to be able to compare kilowatts of energy used per cow.

## Implications

There is some interest in sourcing more information on renewable energy options and it may be worth exploring what is already available in this area and ensuring dairy farmers are aware of opportunities for learning.

## 4.4 Overall satisfaction with program

Questions asked:

Q. Following receipt of Plan: How satisfied have you been with the Smarter Energy Use program? Would you say you are ...? Q. Why do you say that?

Q. 1 year after receipt of Plan: How satisfied have you been with the Smarter Energy Use program? Would you say you are ...? Q. Why do you say that?

### Results for total sample of program participants (Phase 1 + Phase 2):

satisfaction rating/ reasons for rating (main mentions)	% mentioning (base: all respondents; 1 yr later sample)								
	total (n=80)	nth vic (n=14)*	west vic (n=14)*	gipps (n=8)*	nsw (n=4)*	qld (n=10)*	sa (n=10)*	wa (n=9)*	tas (n=11)*
<b>1 year after receiving Plan:</b>									
Very satisfied	41%	21%	50%	38%	50%	30%	40%	56%	55%
Fairly satisfied	55%	79%	50%	63%	50%	60%	50%	44%	36%
Not too satisfied	4%	0%	0%	0%	0%	10%	10%	0%	9%
Not satisfied at all	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total: satisfied	96%	100%	100%	100%	100%	90%	90%	100%	91%
Total: not satisfied	4%	0%	0%	0%	0%	10%	10%	0%	9%
<b>Positive mentions:</b>									
Provided options for saving money/power	49%	36%	64%	50%	25%	50%	40%	56%	55%
Good/thorough process/assessor helpful	35%	21%	21%	38%	50%	30%	40%	56%	45%
Identified energy usage of equipment	25%	21%	36%	38%	25%	10%	20%	33%	18%
Provided benchmark for comparison	30%	36%	36%	25%	25%	30%	40%	22%	18%
<b>Negative mentions:</b>									
Not enough information on tariffs	3%	0%	0%	0%	0%	10%	0%	0%	9%
Assessment generic/initial figures not accurate	3%	0%	0%	0%	0%	10%	10%	0%	0%
Should have included irrigation energy use	1%	0%	0%	0%	0%	10%	0%	0%	0%
Too long to receive report	1%	0%	0%	0%	0%	0%	0%	11%	0%
Assessor didn't present report as was promised	1%	0%	0%	0%	0%	0%	0%	0%	9%

\*Caution: very small sample sizes. Data included for interest only.

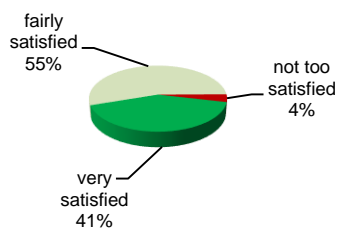
### Comparison of results between Phase 1 and Phase 2 of the program:

satisfaction rating/ reasons for rating (main mentions)	% mentioning (base: all respondents; 1 yr later sample)	
	phase 1 (n=50)	phase 2 (n=30)
<b>1 year after receiving Plan:</b>		
Very satisfied	32%	↑ 57%
Fairly satisfied	62%	43%
Not too satisfied	6%	0%
Not satisfied at all	0%	0%
Total: satisfied	94%	100%
Total: not satisfied	6%	0%
<b>Positive mentions:</b>		
Provided options for saving money/power	40%	↑ 63%
Good/thorough process/assessor helpful	28%	47%
Identified energy usage of equipment	26%	20%
Provided benchmark for comparison	24%	37%
<b>Negative mentions:</b>		
Not enough information on tariffs	4%	0%
Assessment generic/initial figures not accurate	4%	0%
Should have included irrigation energy use	2%	0%
Too long to receive report	2%	0%
Assessor didn't present report as was promised	2%	0%

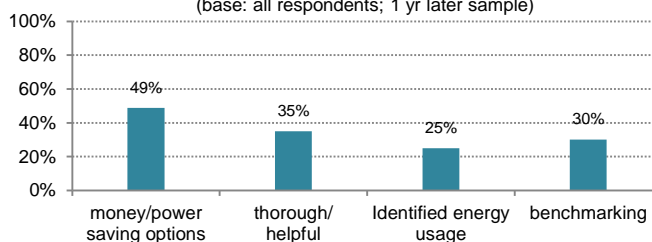
\*Caution: very small sample sizes. Data included for interest only.

↑ statistically significant increase since Phase 1

**satisfaction with project**  
(base: all respondents; 1 yr later sample)



**main reasons for satisfaction**  
(base: all respondents; 1 yr later sample)



## Results

- Almost all respondents (96%) said they were either *fairly* (55%) or *very* (41%) *satisfied* with the Smarter Energy Use program. The proportion of respondents *very satisfied* rose significantly between Phase 1 and Phase 2 (up from 32% to 57%).
- Satisfaction is due to a variety of factors, namely:
  - The Energy Efficiency Plan provides both short and long term options for saving money/power as well as helping prioritise future changes:
 

*"It gives us a plan to make changes short term and a plan to make changes down the track as things wear out. Before receiving it, I had no idea what I could do to use electricity efficiently. I could go ahead blindly replacing things but after knowing what was using what, it gives you an idea of which way to go."*

*"It identified where the real costs are in the dairy and helps prioritise where you need to spend money to get the greatest savings. The assessor was great. He put a dollar value on all the possible changes and didn't recommend anything that wasn't going to give me a net benefit."*
  - The thoroughness and skill of the assessor
  - Provides a benchmark for power usages
  - Confirms where the dairy is running efficiently:
 

*"It was really good to know that we are close to the mark in terms of efficiency and knowing that we aren't wasting the power, because the cost of it is getting out of control at the moment."*
- Notably, there was a marked improvement between Phase 1 and Phase 2 of the program in the proportion of respondents saying they were satisfied due to being provided with options for saving money and power.
- Only 3 respondents were dissatisfied with the program, mainly due to belief the figures they had to provide to the assessor prior to the audit were difficult to calculate accurately:
 

*"I don't think the detail around the Plan is good enough. It's all based on guesses as to how long machines run for and in an operation this size, unless you put meters on everything it's just too hard to calculate."*

## Implications

Satisfaction with the program is high and it has clearly achieved its goals of increasing awareness of inefficiencies in the dairy and where improvements can be made.

Decisions made by Dairy Australia to only offer contracts to assessors proven to perform extremely well in Phase 1 of the program has resulted in more participants being very satisfied with their experience.

## 4.5 Farmer recommendations to improve future programs

Question asked:

Q. Is there any aspect of the program that could have been better or is there anything you can recommend to improve similar programs that may be run in future?

### Results for total sample of program participants (Phase 1 + Phase 2):

recommendations to improve program (main mentions)	% mentioning (base: all respondents; 1 yr later sample)								
	total (n=80)	nth vic (n=14)*	west vic (n=14)*	gipps (n=8)*	nsw (n=4)*	qld (n=10)*	sa (n=10)*	wa (n=9)*	tas (n=11)*
Provide further information on tariffs	8%	0%	7%	0%	0%	30%	10%	0%	9%
Irrigation energy efficiency	5%	0%	0%	0%	0%	30%	0%	0%	9%
Greater focus on renewable energy	5%	0%	0%	0%	0%	30%	0%	0%	9%
List of knowledgeable tradespeople able to carry out works	5%	0%	0%	0%	0%	30%	0%	0%	9%
No recommendations	89%	100%	93%	100%	100%	50%	90%	100%	82%

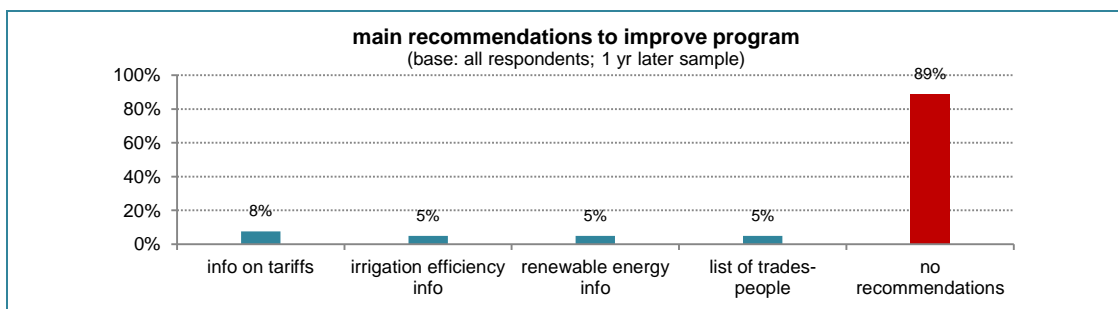
\*Caution: very small sample sizes. Data included for interest only.

### Comparison of results between Phase 1 and Phase 2 of the program:

recommendations to improve program (main mentions)	% mentioning (base: all respondents; 1 yr later sample)	
	phase 1 (n=50)	phase 2 (n=30)
Provide further information on tariffs	8%	7%
Irrigation energy efficiency	6%	3%
Greater focus on renewable energy	6%	3%
List of knowledgeable tradespeople able to carry out works	6%	3%
No recommendations	89%	90%

\*Caution: very small sample sizes. Data included for interest only.

↑ statistically significant increase since Phase 1



## Results

- In line with widespread satisfaction with the program, only 11% of respondents were able to recommend improvements.
- Those who could typically suggested the following:
  - Supply additional information to ensure farmers are on the most suitable tariffs (8% of respondents mentioning)
  - Include irrigation systems in future assessments (5%)
  - Provide information on renewable energy systems (5%)
  - Provide a list of knowledgeable trades people able to carry out recommended work (5%):

## Implications

Clearly the Smarter Energy Use program has been well received by participating dairy farmers, with only a handful able to suggest only minor improvements.

## 5. Smarter Energy Use program structure

### 5.1 Creating program awareness and drivers to participation

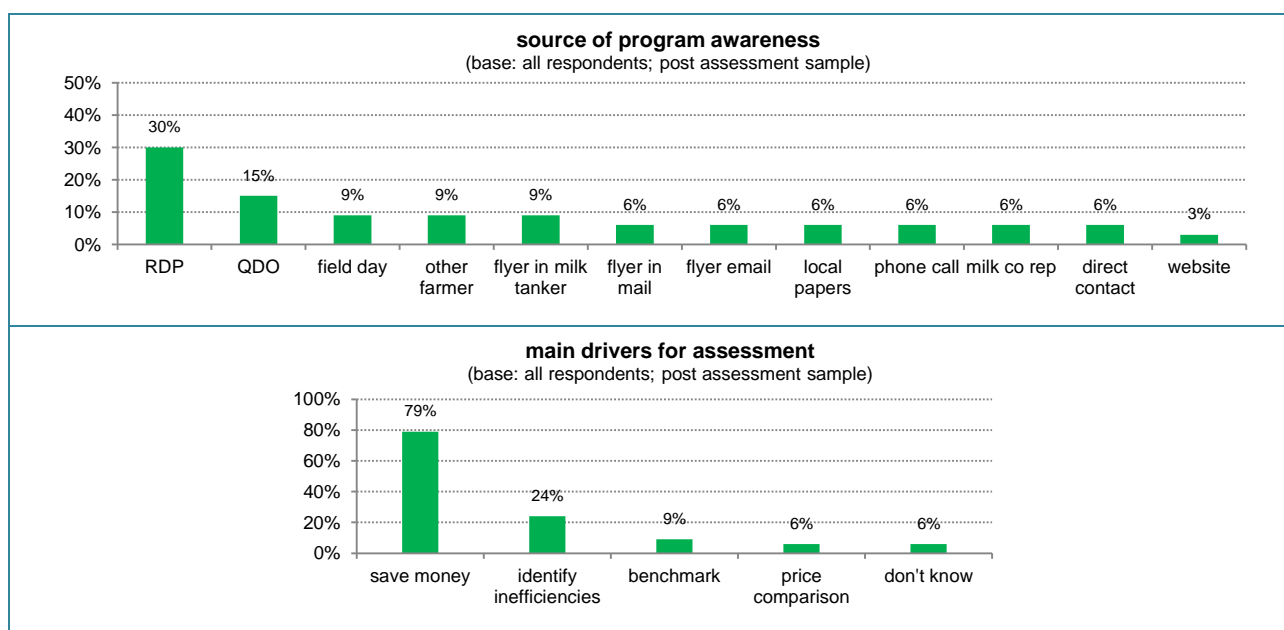
Questions asked:

Q. How did you hear about the energy assessments being conducted through Dairy Australia?

Q. What encouraged you to apply to have an energy assessment conducted on your farm?

awareness source/ driver to participate (main mentions)	% mentioning (base: all respondents; post assessment sample)							
	total (n = 33)	nth vic (n = 5)*	west vic (n = 7)*	gipps (n=4)*	qld (n=5)*	sa (n = 4)*	wa (n = 2)*	tas (n = 6)*
Through the RDP	30%	0%	14%	50%	0%	50%	50%	67%
QDO	15%	0%	0%	0%	100%	0%	0%	0%
At a field day	9%	20%	29%	0%	0%	0%	0%	0%
From other farmers	9%	20%	14%	25%	0%	0%	0%	0%
Flyer with the milk tanker	9%	0%	14%	50%	0%	0%	0%	0%
Flyer in mail	6%	0%	14%	0%	0%	0%	0%	17%
Flyer via email	6%	20%	0%	0%	0%	0%	50%	0%
Local papers	6%	0%	29%	0%	0%	0%	0%	0%
Phone call	6%	0%	0%	0%	0%	50%	0%	0%
Through milk co rep	6%	20%	0%	25%	0%	0%	0%	0%
Direct contact/call from service provider	6%	0%	0%	0%	0%	25%	0%	17%
Website	3%	20%	0%	0%	0%	0%	0%	0%
Potential to save money	79%	100%	86%	100%	40%	50%	100%	83%
Identify inefficiencies in dairy	24%	40%	29%	0%	60%	0%	0%	17%
Benchmark against other farms	9%	0%	14%	0%	0%	0%	50%	17%
Understand supplier price/rates	6%	20%	0%	25%	0%	0%	0%	0%
Don't know	6%	0%	0%	0%	0%	50%	0%	0%

\*Caution: very small sample sizes. Data included for interest only.



## Results

- Awareness of the program was created through a number of means, but mainly RDP's in Tasmania, Gippsland, SA and WA, local papers, flyers with the mail and field days in WestVic and several different means in Nth Vic. Queensland respondents were informed purely via the Queensland dairy farmer's organisation.
- The possibility of saving money was the key driver behind program participation.

## Implications

Awareness of the Smarter Energy Use Program has been created through a variety of means, highlighting the importance of a multipronged communication strategy for programs of this nature. Promotion through RDP's in certain regions is beneficial, particularly when used in conjunction with other methods. Stressing the reducing energy consumption is likely to result in cost savings is key to encouraging program participation.

## 5.2 Assessor aptitude

Q. Did you have any questions you wanted the assessor to answer while he/she was on the farm? Q. Were your questions answered to your satisfaction? Q. What do you still need to know?

Q. Do you have any comments to make about your experience with the assessor, either good or bad?

assessor questions/perceptions (main mentions)	% mentioning (base: all respondents; post assessment sample)							
	total (n = 33)	nth vic (n = 5)*	west vic (n = 7)*	gipps (n=5)*	qld (n=5)*	sa (n = 4)*	wa (n = 2)*	tas (n = 6)*
Had questions for assessor	58%	40%	57%	75%	80%	50%	0%	67%
Questions answered satisfactorily	36%	40%	0%	50%	80%	25%	0%	50%
Needed comparison of vacuum pumps	7%	0%	14%	0%	0%	0%	0%	17%
Areas to save money	7%	0%	29%	0%	0%	0%	0%	0%
Use of green wash to cut down on water/chemicals	4%	0%	14%	0%	0%	0%	0%	0%
More information on heat exchange	4%	0%	14%	0%	0%	0%	0%	0%
Wait for report to receive information	4%	0%	14%	0%	0%	0%	0%	0%
Good communication/knowledgeable	64%	20%	86%	75%	80%	50%	100%	50%
Identified areas to assist energy usage	24%	0%	14%	50%	0%	50%	0%	50%
Assessment simple/efficient	18%	80%	14%	0%	20%	0%	0%	0%
Nothing useful yet but will wait for report	6%	0%	0%	0%	20%	0%	0%	17%
Time to receive post assessment report too long	3%	0%	14%	0%	0%	0%	0%	0%

\*Caution: very small sample sizes. Data included for interest only.

## Results

- Assessors on 27 of the 33 farms included in this evaluation were asked additional questions. These questions were answered satisfactorily according to 10 respondents, but 6 required more information on the following:
  - Comparison of vacuum pumps (2 respondents mentioning)
  - Areas to save money (2 respondents)
  - Further information regarding heat exchange (1 respondent)
  - Use of clean green wash to reduce chemical and water usage (1 respondent)
- When asked to comment on their experience with the assessor, respondents typically had positive responses. Being knowledgeable and providing good communication and an efficient assessment process highlighted as reasons for a positive experience. The following comments are typical:
 

*"The assessor was a wealth of knowledge and the process was excellent."*

*"The assessor was excellent and really easy to talk to. I had a great experience - the assessor made it easy, he explained it well and was very patient."*

*"I had a very good experience and a good discussion in regard to replacing quantum heat pumps with solar or rearranging our hot water system."*
- Waiting too long to receive their energy efficiency plan led to one respondent having a negative perception of their assessor and two respondents had not found the assessment useful, one stating:
 

*"Need to have the report as I can't really say that I have got anything useful yet."*

## Implications

Interaction with assessors has been positive for nearly all respondents and assessors were generally perceived as knowledgeable and able to communicate effectively. Some respondents did not find the assessment process useful and are relying on their post assessment efficiency plan for further information. Reports should be prepared and presented to farmers as soon as possible after the on farm assessment.

## **Appendix: Questionnaires**

## Appendix: Questionnaires

### Post assessment questionnaire:

- Q1. How did you hear about the energy assessments being conducted through Dairy Australia?
- |  |       |    |
|--|-------|----|
| Local papers   | ----- | 1  |
| Flyer in the mail  | ----- | 2  |
| Flyer with the milk tanker   | ----- | 3  |
| Flyer via email  | ----- | 4  |
| Phone call   | ----- | 5  |
| Through the RDP  | ----- | 6  |
| Through the milk co rep  | ----- | 7  |
| Through direct contact/phone call from a service provider/dairy technician/electrician/etc | --    | 8  |
| Through email from service provider/dairy technician/electrician/etc                       | ----- | 9  |
| From another farmer  | ----- | 10 |
| At a field day   | ----- | 11 |
| Website  | ----- | 12 |
| Other (specify)  | ----- | 13 |
| Can't recall   | ----- | 14 |
- Q2. What encouraged you to apply to have an energy assessment conducted on your farm? Record verbatim. *Explore (but do not prompt) for things like wanting more information on energy saving options, renewable energy options, wanting more information on lowering power bills, the cost of energy for the business, where energy is lost in the dairy, etc.*
- .....
- Q3. What sort of information did you want or expect to get from having the assessment conducted on the farm?
- .....
- Q4. Prior to having the assessment conducted, how would you rate your knowledge on a scale of 0 to 10 where 0 = 'no knowledge' and 10 = 'know everything there is to know' about the following ...  
*Interviewer note: you may need to explain the scoring more fully*
- |  |   |   |   |   |   |   |   |   |   |   |    |
|--|---|---|---|---|---|---|---|---|---|---|----|
| 1. Where energy is used in the dairy                                 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2. Which equipment uses the most energy in the dairy                 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 3. Where there can potentially be energy inefficiencies in the dairy | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 4. Energy saving options available for the dairy and the farm        | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
- Q5. Did you have any expectations of the assessment process?
- |     |       |   |          |
|-----|-------|---|----------|
| Yes | ----- | 1 | continue |
| No  | ----- | 2 | go to Q9 |
- Q6. What expectations did you have?
- .....
- Q7. Were your expectations met or realised?
- |     |       |   |          |
|-----|-------|---|----------|
| Yes | ----- | 1 | go to Q9 |
| No  | ----- | 2 | continue |
- Q8. Why do you say that?
- .....
- I want to ask you some questions about the assessor and his/her dealings with you ...
- Q9. Did you have any questions you wanted the assessor to answer while he/she was on the farm?
- |     |       |   |           |
|-----|-------|---|-----------|
| Yes | ----- | 1 | continue  |
| No  | ----- | 2 | go to Q12 |
- Q10. Were your questions answered to your satisfaction?
- |     |       |   |           |
|-----|-------|---|-----------|
| Yes | ----- | 1 | go to Q12 |
| No  | ----- | 2 | continue  |
- Q11. What do you still need to know?
- .....
- Q12. Do you have any comments to make about your experience with the assessor, either good or bad?
- .....



- Q13. How do you feel about the energy efficiency plan which is now being developed for your farm? Would you say you feel ...
- Very positive ----- 1
  - Fairly positive ----- 2
  - Fairly negative ----- 3
  - Very negative ----- 4
  - Neither positive nor negative----- 5

Q14. Why do you say that?  
 .....

I just have a couple of questions about you and then this part of the project will be completed. (or complete with details already collected – just confirm as necessary)

Q15. Firstly, may I please ask your age? \_\_\_\_\_

- Q16. Record gender (but do not ask)
- Male ----- 1
  - Female ----- 2

- Q17. How would you describe the phase your dairy enterprise is currently in? Is it ...
- An expansion phase ----- 1
  - A steady as she goes pattern because it is pretty much where you want it to be ----- 2
  - A steady as she goes pattern because you are unable to expand at the moment ----- 3
  - A winding down phase----- 4

Q18. How many cows were in your milking herd at the peak of last season? \_\_\_\_\_

- Q19. Do you milk ...
- Once a day ----- 1
  - Twice a day ----- 2
  - Three times a day ----- 3
  - Other (specify) ----- 4

- Q20. What sort of dairy do you have?
- Rotary ----- 1
  - Herringbone ----- 2
  - Swing over ----- 3
  - Other (specify) ----- 4

- Q21. State/region
- Nth Victoria ----- 1
  - West Vic ----- 2
  - Gippsland ----- 3
  - Qld ----- 5
  - SA ----- 6
  - WA ----- 7
  - Tas ----- 8

## Post efficiency plan questionnaire:

Q1. I'd just like to check that you've received your Energy Efficiency Plan?  
 Yes ----- 1  
 No ----- 2 record and make time to call back in future

Q2. And have you read through it?  
 Yes ----- 1  
 No ----- 2 record and make time to call back in future

Ask respondent to have their Energy Efficiency Plan close by so they can refer to it.

Q3. How have you found the process of having an energy efficiency assessment conducted for your farm?  
 .....

Q4. What did the assessment include?  
 .....

Q5. Did you learn anything new from the Energy Efficiency Plan?  
 Yes ----- 1 continue  
 No ----- 2 go to Q8

Q6. What did you learn?  
 .....

Q7. How is that knowledge likely to help you in future, if at all?  
 .....

Q8. How would you rate the Energy Efficiency Plan in terms of usefulness to you? Have you found it ...  
 Very useful ----- 1  
 Fairly useful ----- 2  
 Not too useful ----- 3  
 Not useful at all ----- 4  
 Too early to say ----- 5

Q9. Why do you say that?  
 .....

Q10. Now that you have had an energy efficiency assessment conducted, how would you rate your knowledge on a scale of 0 to 10 where 0 = 'no knowledge' and 10 = 'know everything there is to know' about the following ... *Interviewer note: you may need to explain the scoring more fully*

- 1. Where energy is used in the dairy  
 0 1 2 3 4 5 6 7 8 9 10
- 2. Which equipment uses the most energy in the dairy  
 0 1 2 3 4 5 6 7 8 9 10
- 3. Where there can potentially be energy inefficiencies in the dairy  
 0 1 2 3 4 5 6 7 8 9 10
- 4. Energy saving options available for the dairy and the farm  
 0 1 2 3 4 5 6 7 8 9 10

Q11. Is there any additional information you need to help you potentially save energy in future?  
 Yes ----- 1 continue  
 No ----- 2 go to Q13

Q12. What information do you need?  
 .....

Q13. Are you planning to make any changes on the farm as a result of having the assessment conducted and an energy efficiency plan developed?  
 Yes ----- 1 continue  
 No ----- 2 go to Q17

Q14. What changes do you have planned?  
 .....

Q15. How much of an impact are you expecting these changes to have on your energy use?  
 .....

Q16. Were there any changes you would like to make, but probably won't?  
 Yes ----- 1 go to Q18  
 No ----- 2 go to Q21

If no changes planned (Q13 = 2), ask Q17

Q17. Is there a reason why you don't think you will make any changes?

.....

Q18. If respondent would like to make changes, but is unable, ask: What changes would you like to make?

.....

Q19. What sort of support would you need to implement changes?

.....

Q20. If you were able to make changes, what sort of an impact do you think they would make on your energy use?

.....

Q21. How satisfied have you been with the Smarter Energy Use program? Would you say you are ...

- Very useful ----- 1
- Fairly useful ----- 2
- Not too useful ----- 3
- Not useful at all ----- 4
- Too early to say ----- 5

Q22. Why do you say that?

.....

Q23. Is there any aspect of the program that could have been better or is there anything you can recommend to improve similar programs that may be run in future?

.....

I just have a couple of questions about you and then this part of the project will be completed. (or complete with details already collected – just confirm as necessary)

Q24. Firstly, may I please ask your age? \_\_\_\_\_

Q25. Record gender (but do not ask)

- Male ----- 1
- Female ----- 2

Q26. How would you describe the phase your dairy enterprise is currently in? Is it ...

- An expansion phase ----- 1
- A steady as she goes pattern because it is pretty much where you want it to be ----- 2
- A steady as she goes pattern because you are unable to expand at the moment ----- 3
- A winding down phase ----- 4

Q27. How many cows were in your milking herd at the peak of last season? \_\_\_\_\_

Q28. Do you milk ...

- Once a day ----- 1
- Twice a day ----- 2
- Three times a day ----- 3
- Other (specify) ----- 4

Q29. What sort of dairy do you have?

- Rotary ----- 1
- Herringbone ----- 2
- Swing over ----- 3
- Other (specify) ----- 4

Q30. State/region

- Nth Victoria ----- 1
- West Vic ----- 2
- Gippsland ----- 3
- Qld ----- 5
- SA ----- 6
- WA ----- 7
- Tas ----- 8

Q31. Would you be happy for us to contact you in approximately one year?

- Yes ----- 1
- No ----- 2

## 1 year later questionnaire:

- Q1. Over the past year, have you referred to your Energy Efficiency Plan other than to read through it when you first received it?
- Yes ----- 1
  - No, but will prior to making future changes ----- 2
  - No ----- 3

- Q2. Did the Energy Efficiency Plan you received make any recommendations similar to the following?
- Use more off peak electricity ----- 1
  - Change energy supplier or tariff ----- 2
  - Increase maintenance/cleaning of equipment ----- 3
  - Change water temperature/water heating ----- 4
  - Improve milk cooling system ----- 5
  - Make changes to the lighting ----- 6
  - Install/change vacuum pumps ----- 7
  - Other equipment changes (specify) ----- 8
  - Covered/insulated existing equipment ----- 9
  - Other changes (specify) ----- 10
  - No recommendations ----- 11 go to Q13
  - Can't recall ----- 12

If Plan made recommendations, ask Q3. If no recommendations in Plan, ask Q12

- Q3. Have you made any changes as a result of those recommendations?
- Yes ----- 1
  - No ----- 2 go to Q8

If yes:

- Q4. What have you changed?
- Use more off peak electricity ----- 1
  - Change energy supplier or tariff ----- 2
  - Increase maintenance/cleaning of equipment ----- 3
  - Change water temperature/water heating ----- 4
  - Improve milk cooling system ----- 5
  - Make changes to the lighting ----- 6
  - Install/change vacuum pumps/heat exchange unit ----- 7
  - Other equipment changes (specify) ----- 8
  - Covered/insulated existing equipment ----- 9
  - Other changes (specify) ----- 10
  - Can't recall ----- 12

- Q5. Have these changes ...
- Substantially reduced power consumption ----- 1
  - Slightly reduced power consumption ----- 2
  - Not changed power consumption at all ----- 3
  - Can't tell yet ----- 4 go to Q7

- Q6. How satisfied are you with this change in power consumption/the fact power consumption hasn't altered? Are you ...
- Very satisfied ----- 1
  - Fairly satisfied ----- 2
  - Not too satisfied ----- 3
  - Not satisfied at all ----- 4

If purchased equipment or new lighting, ask:

- Q7. Did information gained through the Energy Audit assist you in any way to make decisions about the equipment/lighting you purchased?
- Yes ----- 1
  - No ----- 2 go to Q9

- Q8. In what way did it assist? *Do not prompt*
- Considered energy efficiency of equipment ----- 1
  - Purchased equipment that will use heat recovery/solar or similar ----- 2
  - Other (specify) ----- 3

If Plan made recommendations, but no changes made yet, or if not all changes recommended have been made ask:

- Q9. Do you plan to make any changes/any further changes in future as a result of those recommendations or are there changes/further changes you would like to make but probably won't be able to?
- Yes ----- 1 continue
  - No ----- 2 go to Q11

If yes:

- Q10. What changes do you have planned or would you like to make?
- Use more off peak electricity ----- 1
  - Change energy supplier or tariff ----- 2
  - Increase maintenance/cleaning of equipment ----- 3
  - Change water temperature/water heating ----- 4
  - Improve milk cooling system ----- 5
  - Make changes to the lighting ----- 6
  - Install/change vacuum pumps ----- 7
  - Other equipment changes (specify) ----- 8
  - Covered/insulated existing equipment ----- 9
  - Other changes (specify) ----- 10
  - Can't recall ----- 12

Q11. If have changes planned or would like to make in future, ask:  
What has prevented you from making changes?

If no changes made or planned, ask:

Are there any reasons why you won't make the changes recommended?

- Too expensive/can't afford ----- 1
- Current equipment still working fine ----- 2
- Don't believe they will have much of an impact on power consumption ----- 3
- Other (specify) ----- 4

Q12. What sort of support, if any, would you need to implement changes?  
.....

If Energy Efficiency Plan did not recommend changes, ask Q13. All others go to Q16

Q13. Although your Energy Efficiency Plan did not recommend any changes to energy use in the dairy, do you believe having the audit conducted on your farm will influence your thinking in any way about energy consumption in the dairy in the future?

- Yes ----- 1 continue
- No ----- 2 go to Q15

If yes:

Q14. In what way?  
.....

If no:

Q15. Why do you say that?  
.....

Ask all:

Q16. Has the energy audit of your dairy changed your attitude towards energy consumption generally in any way at all?

- Yes ----- 1 continue
- No ----- 2 go to Q18

If yes:

Q17. In what way?  
.....

Q18. How satisfied have you been with the Smarter Energy Use program? Would you say you are ...

- Very satisfied ----- 1
- Fairly satisfied ----- 2
- Not too satisfied ----- 3
- Not satisfied at all ----- 4
- Too early to say ----- 5

Q19. Why do you say that?  
.....

Q20. Is there any aspect of the program that could have been better or is there anything you can recommend to improve similar programs that may be run in future?  
.....

I just have a couple of questions about you and then this part of the project will be completed. (or complete with details already collected – just confirm as necessary)

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Q22. Record gender (but do not ask)

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