

23 December 2016

Office of Environment and Heritage

Manager Sustainable Energy Projects

NSW Department of Industry – Division of Resources and Energy

energysavings.scheme@industry.nsw.gov.au

Re: NSW Energy Savings Scheme – Rule Change 2016-2017

Embertec Pty Ltd welcomes the opportunity to provide comments to the New South Wales Government's NSW Department of Industry – Division of Resources and Energy as part of the consultation on 'NSW Energy Savings Scheme – Rule Change 2016 -2017'.

Embertec is a leading developer and manufacturer of energy efficiency and energy productivity technology with sales to Australia, Canada, and the United States. Embertec is proudly an Australian SME and is investing more than \$3M annually on research and development. Embertec has extensive experience as a supplier of products for installation under the South Australian REES Scheme, the Capital Territory's Energy Efficiency Improvement Scheme (EEIS), the New South Wales Energy Saver Scheme (ESS), as well as to businesses accredited under the Victorian Energy Efficiency Target (VEET) scheme.

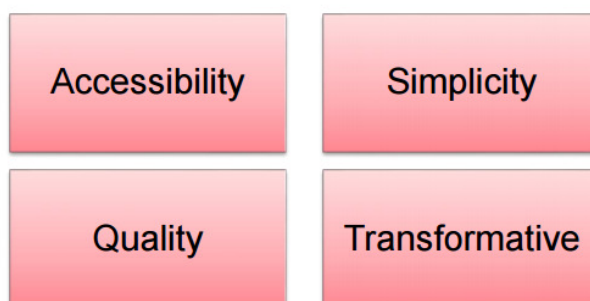
We commend the efforts of the NSW Government and its Departmental staff in their ongoing commitment to improving the ESS scheme. This year is understood to be a "minor" rule change process with perspective changes to include a sampling approach to augment PIAM&V method and number of amendments targeted towards improving access by the SME sector.

This suite of proposed amendments is likely to provide a few incremental steps forward to improve the scheme. The introduction of Table E1.2 for small business and of a sampling PIAM&V sub-method may offer an exciting path forward for ACP. Sampling PIAM&V in particular could support a number of different products and business models assuming that scheme Rules and IPART afford sufficient flexibility and scope for ACPs to define, implement, and measure energy changes in a manner consistent with the framework and approach of PIAM&V. Embertec view this change very positively but before declaring it a winner however we would first want and need to understand better what types of administrative requirements are going to be put on this activity.

In respect of the remaining tranche of proposed amendments Embertec maintain a similar position with that which we communicated last year. That is, we take a critical view of current Rules underpinning the 'Home Energy Efficiency Retrofit' as maintaining barriers to uptake for the Residential sector and the current set of amendments being put forward this year again will likely be insufficient to increase (or even initiate) uptake of the activity in that sector.

Figure 1 is from the OEH and outlines the four key principles that are proposed Rules are evaluated against.

Figure 1 – key evaluation principles for ESS Rule amendments



To date the HEER sub-method has demonstrated that it is neither realistically accessible to residential consumers, nor is it practical for ACPs to deliver or simple for consumers to understand. As a result the method has delivered zero transformative energy efficiency and the quality of the products installed or the upgrade itself cannot even be assessed. We remain sceptical that the amendments (as proposed) this year will be sufficient to result in significant scaling of activities in the residential sector (potentially marginal uptake by the SME sector) and without further amendments we will be presenting a similar position again in a year's time.

In putting forward our submission this year we also are submitting evidentiary data of a residential lighting upgrade trial Embertec conducted in Sydney to test a business model under the 2016 amended Rules of HEER. Attachment A which is **commercial in confidence** includes the business metrics of that real life trial and illustrates the actual costs of delivering energy efficient lighting to NSW residential households under the existing HEER rules. It also provides a direct comparison to a similar campaign we undertook in Victoria under the VEET scheme (which resulted in a successful rollout of around 1m downlights in some 50,000 homes by the leading AP). The difference is glaring and ultimately the trial confirmed that the New South Wales residential market remains unviable.

While there are a number of elements that the Department has included in the consultation the focus of our response is to communicate remaining barriers (particularly as they relate to downlight replacement) and offer alternative options that will tick the boxes of Figure 1 accordingly and which are likely to encourage ACP participation in the HEER sub-category. The main points to convey include the following requests:

- **Remove the \$90 household co-payment** – the ESS is a market based scheme, the co-payment at best adds complexity and overhead costs to existing and prospective ACPs and at worst is an arbitrary fee imposed on households. We recognise that the NSW Government is expecting the co-payment to address concerns around give-away business models and issues around product persistence and to be a catalyst that creates an “engaged” consumer but it is effectively creating a tax where there shouldn’t be one. Furthermore it creates challenges in communication with consumers thus reducing uptake, and favours larger more affluent residents. Let the market determine where the opportunities exist or don’t exist.
- **Allow a lighting product’s rated lifetime value to contribute to the determination of its ESS Energy Saving** – the current ESS rule that applies a constant of 15 years for Lifetime does not encourage installation of the suite of high efficiency products now available. The currently successful products installed in the VEET scheme have rated lifetimes of 40,000-50,000 hours.
- **Establish savings factor “bands” for residential lighting products** – Products with high efficacy and long lifetimes are increasingly available, or are able to be developed, but this higher quality comes at a cost. It is important to recognise and reward higher quality. Higher performing products that carry higher Electricity Savings Factors will more likely be installed over poor quality product; leading to greater customer satisfaction and persistence of savings.
- **Allow retrofits of compatible ‘lamp only – ELV’ replacements where magnetic transformers are installed** – the perception that such products have a high level of incompatibility leading to a tendency to fail once installed is outdated. There is a range of compatible ‘lamp only’ LED downlight products available in Australia now that have undergone rigorous testing to establish compatibility with existing halogen magnetic transformers. These products have also been proven in the field with over 5m installed in Victoria alone.

- **Encourage bundling through an expanded the portfolio of low cost/high quality products –**
the most cost effective bundling for ACPs is through activities where a single installer can complete the works without the need to coordinate multiple suppliers and/or tradesmen.

Despite our criticisms, Embertec thank and commend the NSW government on establishing an annual review of the ESS Rules. Embertec consider the annual review an important and welcome mechanism that will improve business certainty as well as provide a valuable opportunity for ongoing dialog with the Department, OEH, and IPART on ESS matters.

Embertec is prepared to provide appropriate time and resources as requested to support the Department's continuing efforts to improve the ESS scheme. Should you have any questions regarding this submission, please contact me or David Levine.

We look forward to continued discussions,

Henry Otley

Embertec, Strategic Business Analyst

Email: henry@embertec.com

David Levine

Chief Marketing Officer

Email: david@embertec.com

Contents

General comments.....	7
Part one – prioritise the residential sector	9
Action one - improve access to lighting as a priority	10
Action two – remove the \$90 co-payment	12
Action three – better reward high quality long lasting lighting replacements.....	12
Action four – expand the options for lighting upgrades to include ‘lamp only - ELV’ retrofits where there is currently a magnetic transformer installed.....	15
Action five – make changes that would achieve deeper retrofits	18
Part 2 – Responses to OEH consultation questions	20
Section 2 – General ESS Rue	20
2.1 Data Requirements	20
Section 3 – Project Impact Assessment with Measurement and Verification Method.....	21
3.1 Effective Range	21
3.2.1 Eligibility Requirement.....	21
3.2.2 Representativeness.....	22
3.2.3 Measurement and statistical requirements	22
3.2.4 Bias.....	22
3.2.5 Normal year	22
Section 4 – Metered Baseline Method	23
4.1 NABERS for Hospitals	23
5. Deemed Energy Savings Method	23
5.1.1 Equipment Requirements and product approvals.....	23
5.1.2 Purchaser Co-payment.....	23
5.2 Sale of New Appliances.....	26
5.2.1 Adjustment to the SONA Equipment Energy Savings	26
5.3 Commercial Lighting	26
5.3.1 Air-conditioning Multipliers	26
5.3.2 Control Gear for fluorescent lamps	26

5.4 Public Lighting Energy Savings Formula.....	26
5.5. Home Energy Efficiency Retrofits	27
5.5.1 Definition of Small Business Building and Residential Building	27
5.5.2 Small Business Building default savings factors.....	27
5.5.3 ELV Halogen to 240V LED.....	28
5.5.4 Replacing a T8 or T12 Luminaire with a LED Luminaire	28
5.6 High Efficiency Appliances for Businesses	29
5.6.1 Installing a New High Efficiency Air-conditioner in Small Business Buildings.....	29
Conclusion.....	29
Attachment A – Embertec NSW trial results.....	30

General comments

The NSW Department of Industry through the Office of Environmental Heritage (OEH) is seeking stakeholder feedback to the December 2016 Consultation Paper on proposed amendments to the ESS Rules. Embertec thank OEH for ongoing dialog with ESS scheme stakeholders and welcome the opportunity once again to provide feedback in this submission.

In this December 2016 consultation, there are a range of proposals put forward which are broadly aimed at improving access and opportunities for business (in particular SME) to benefit through the ESS but scare on proposals that would increase opportunity for the residential sector in NSW. This appears to be a change in priority on a certain level compared with the 2015 consultation which – among other things – positioned the Government as strongly advocating to get the residential sector more involved in the ESS scheme principally through changes targeted at simplifying the HEER method. The changes that ultimately where introduced during 2016 were welcome but it was argued by us and others in responses that they did not go far enough and now one year on there is still zero uptake of that method. Now, frustratingly the proposals put forward in this consultation do not appear to acknowledge the fact that there remain genuine barriers to deliver ESS activities to the residential sector or directly ask stakeholders to address the remaining barriers.

In general, Embertec's view is that the proposed amendments included in this consultation are that they are incremental at best and unlikely to provide any substantial improvements to the accessibility of direct scheme benefits for the underserved residential and SME sector. The potential exception to that view being the exciting opportunity that could evolve through the introduction of the sampling PIAM&V method. For product developers and innovators such as Embertec a sampling approach to PIAM&V has broad appeal. While perhaps small steps are better than no steps, OEH should rise to the challenge and include Rule amendments to address the lack of participation in the residential sector which had been a key priority last year. As discussed in this submission, there are pragmatic options much of which we presented last year that if adopted now will improve the scheme and finally support a business case for ACPs to reach out to and deliver energy efficiency to residential and SME sectors.

In responding to this consultation, we have split our comments into two separate parts. In part one of this submission, we are advocating once again that the NSW Government and OEH prioritise the residential sector and present options that we contend would remove red tape and get real engagement from both residential and SME consumers. Part two of this submission includes Embertec's comments and responses to the selection of specific questions that OEH is asking in the consultation document.

Part one – prioritise the residential sector

Despite a number of legislative amendments introduced during 2016 that – conceptually at least – removed red-tape in a manner that did not compromise the integrity of the scheme or the quality of residential energy efficiency retrofits there was no residential certificates created from the HEER method. Enthusiasm from stakeholders and ACPs was also tepid during 2016 as there were only two ACPs that took the initiative to become accredited to perform the activities. While the changes at least on the surface appear to be supportive, clearly, they alone were not sufficient to initiate participation. The wait and see period has long passed now and with this consultation the Government should take positive steps that build off of last year's efforts and deliver additional changes to support the more than 2.5 million occupied homes in NSW.

As the 2015 consultation paper identified the costs to businesses to participate under current HEER rules were too high. One year on, despite changes, the costs remain too high. This is not simply an opinion that we are putting forward but instead a substantiated position based on our own experiences and results of trials of a HEER business model actually conducted in the Sydney areas of Blacktown and Rouse Hill during 2016. Embertec made a strategic investment in marketing and electrical contractors to test and evaluate if we could establish a business model that could be supported under the HEER activity Rules. The result was a resounding NO; the financial outcomes of that exercise are presented in a commercial in confidence Attachment to this submission and ultimately point to three key learnings:

- For LED downlights, which are arguably the most visible, understood, and easily accessible energy efficiency product currently available to households the incentive is insufficient. Specifically the Deemed Activity Electricity Savings attached to the activity is not representative of actual product attributes or lifetime savings where efficacy can be > 100W/lumen and the standard rated lifetime is > 30,000 hours.
- The co-payment requirement only complicates the business model and confuses the consumer. The co-payment does nothing to advance the Government objectives outlined in this consultation to ensure customers engage with the project and ensure customers receive quality products that are fit for purpose. Those objectives would be better addressed through other mechanisms.

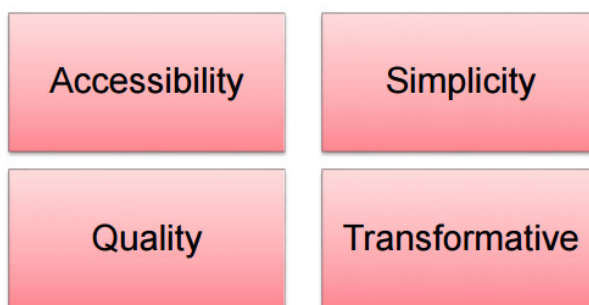
- The value proposition is simply not compelling enough for the consumer to overcome the upfront capital requirements and in turn establish a demand for LED downlight energy efficiency upgrades (or an opportunity to bundle additional energy efficiency products and services).

Our trials demonstrated that the HEER method is still not an attractive option for ACPs or consumers and there are still improvements required. The expansion of the BCA categories to include additional types of residential and SME in the HEER is welcome but still does not address some fundamental out of pocket costs and administrative red-tape. One sure way to make HEER more attractive would be to increase scheme targets but we appreciate that the target has only just been increased and expansion is not a realistic option at this time. Therefore, similar to what we proposed last year, we recommend that OEH take the following actions to improve the HEER method and deliver energy efficiency to the residential sector:

1. Improve access to lighting upgrades as a priority
2. Remove the \$90 co-payment
3. Better reward high quality long lasting lighting replacements
4. Expand the options for lighting upgrades to include 'lamp only – ELV' replacements for halogen downlights with magnetic transformers
5. Deliver deeper (ie. multiple activities) retrofits to eligible HEER participants by introducing a wider selection of relatively low cost deemed activities and incentivising ACPs with a "bonus" for instances where multiple activity retrofits do take place.

Action one - improve access to lighting as a priority

Lighting is a crucial gateway activity to increased awareness and delivery of tangible benefits of energy efficiency to the residential sector. It is the low cost/high value opportunity that is most often cited in general conversation about home energy efficiency. Lighting upgrades are also the most tangible opportunity to introduce energy efficiency value to those that don't understand it well. Of all the deemed activities available to household and SMEs under the ESS, efficient lighting is the one that can be delivered at scale. Embertec is confident that appropriate updates to the ESS Rules to remove red tape to the HEER scheme and improve the deemed lighting activity can be done simply and critically in a design meet the core Rule change principles set out by the Government below.



The lifetime benefits that LED lighting upgrades, specifically the replacement of halogen downlights can provide are well understood and can drive a transformative reduction in energy use to NSW as it is already doing in Victorian through the support of the VEET scheme.

Table 1 – Comparison of lighting upgrades in Victoria (VEET) and NSW (ESS)

	VIC	NSW
Occupied homes	1,944,000	2,471,299
Owner occupied	1,362,000	1,644,000
Rented	582,000	827,299
Assumed proportion of homes w/ downlights	60%	60%
Total opportunity (for owner occupied)	817,200	986,400
Homes transitioned to LED downlights (through EE program)	≈370,000	≈130
Proportion of eligible homes with LED downlights	45%	≈ 0%
Annual \$ savings (assume \$85/annum/home)	\$31,450,000	11,050
\$ savings over 10 years for households (assume \$850/home)	\$310,450,000	110,500
NOTE: a 10 year savings is very conservative for products that will typically last more than 30,000 hours and will not include inevitable year on year retail electricity price rises		

We maintain that the points made one year ago remain valid. The co-payment requirement together with the genuinely low product lifetime Electrical Savings Factor values attached to LED downlight retrofits simply does not offer a compelling proposition for the consumer despite what the NSW Government highlighted in the 2015 consultation paper as an \$850 savings over \$10 years for simply replacing 10 halogen downlights with LED products. Frustratingly, as a prospective ACP in the ESS with the capacity and proven capabilities to deliver energy efficiency at scale and drive the energy efficiency conversation and education to households the ESS is not yet a vehicle that will support our entry to the market.

Action two – remove the \$90 co-payment

Embertec maintain the position that the co-payment provision is a completely unnecessary requirement and while the intent behind the decision to introduce it (i.e. ensure that consumers are engaged with project and receive high quality products) is reasonable there are better options to achieving the objectives that don't involve placing an out of pocket cost requirement on a consumer. It should be removed from the Rules in full immediately.

The rationale for our position is expanded on later on page 24 in our response to Question 8 of the consultation paper.

Action three – better reward high quality long lasting lighting replacements

The manner in which 'Activity Definition for E1' establishes and applies energy savings factors results in a situation where the ESS benefit does not align with the actual product performance and is ultimately too low to make the incentive attractive. Through the current approach there is no incentive to source and/or offer higher quality and longer lasting products to households. In fact it provides a perverse incentive that penalises the high quality products by applying a comparably "low" deemed lifetime and encourages ACPs who are prepared to provide the lowest possible quality.

We strongly recommend that the NSW Government move to an energy saving calculation approach similar to that used in the VEET scheme that categorises and classifies the energy savings for different LED products using the key lamp attributes of efficacy and lifetime as opposed to lamp circuit power and a globally applied value of 15 years (which was improved in 2016 from 10 to 15 years) for lifetime. The VEET approach aligns the savings factor with the actual energy savings delivered over the lifetime of the LED product. It also encourages the installation of higher quality products, without setting minimum standards which make the category uneconomical to service.

While Greenhouse Gas savings attributed to lighting retrofits in Victoria compared with NSW can vary, the actual electricity savings should not be materially different yet for some reason the actual electricity savings figures do vary materially between the two state schemes.

The ideal solution in our view (which would also tick a couple boxes in the commitment to "align" EE schemes) would be for NSW to pick up and use the VEET abatement factors for its 21C, 21D and 21E

activities. To adapt the VEET requirements to the NSW format we propose the scheme move to energy savings matrix similar to the Table 2. Table 2, if adopted, would provide expanded categorisation rewarding desirable product attributes ultimately to the benefit of higher quality, longer life LED retrofits in homes and SMEs.

Table 2 – Proposed revised Energy Savings Factor table E1.1 – replace halogen downlight with efficient luminaire and/or lamp

Activity Energy Savings						
<i>Deemed Activity Electricity Savings = Savings Factor</i>						
Where:						
<ul style="list-style-type: none"> <i>Savings Factor</i>, in MWh, is the value from Table E1.1 corresponding to the existing Lamp or Luminaire where the Efficacy of the replacement Lamp being installed (in Lm/Watts); and <i>Lamp Efficacy Circuit Power</i> is the Efficacy Circuit Power of the replacement Lamp and Driver being installed (in Lm/Watt) 						
Table E1.1 Savings Factors (MWh per Lamp replaced)						
Existing Lamp and/or Luminaire	New Lamp and/or Luminaire	Rated life of new lamp (hrs)	Energy Savings Factor			
			New lamp efficacy (Lm/W)			
			Minimum Efficacy	High Efficacy 1	High Efficacy 2	High Efficacy 3
Tungsten halogen Lamp (ELV) with Electronic Transformer or Infrared coated (IRC) halogen Lamp (ELV) with Electronic Transformer with or without Luminaire.	LED Lamp and Driver or LED Luminaire recessed	20,000 to 25,000				
		25,000 to <30,000				
		30,000+				
	LED Lamp only - ELV	20,000 to 25,000				
		25,000 to <30,000				
		30,000+				
Tungsten halogen Lamp (ELV) with Magnetic Transformer or Infrared coated (IRC) halogen Lamp (ELV) with	LED Lamp and Driver or LED Luminaire -	20,000 to 25,000				
		25,000 to <30,000				

Magnetic Transformer., with or without Luminaire.	recessed	30,000+				
Tungsten halogen Lamp (ELV) with Electronic Transformer, or Infrared coated (IRC) halogen Lamp (ELV) with Electronic Transformer., with or without Luminaire.	LED Lamp only – 240V Self Ballasted	20,000 to 25,000				
		25,000 to <30,000				
		30,000+				
Tungsten halogen Lamp (ELV) with Magnetic Transformer, or Infrared coated (IRC) halogen Lamp (ELV) with Magnetic Transformer, with or without Luminaire	LED Lamp only – 240V Self Ballasted	20,000 to 25,000				
		25,000 to <30,000				
		30,000+				
Tungsten halogen Lamp (240V)), with or without Luminaire	LED Lamp only – 240V Self Ballasted or LED Luminaire - recessed	20,000 to 25,000				
		25,000 to <30,000				
		30,000+				

Higher specification for better products

Businesses do not want customer complaints and warranty work as it significantly increases costs, and as a result, all of the products we supply and/or source in the VEET scheme are above 500 lumens and 55 degree beam angle. Allowing the lower limit will only expose NSW ACPs to learning this the hard way, costing them money and damaging the reputation of the scheme

Embertec recommends that the previous (2015) initial downlight light output requirement of 500 lumens be reinstituted from the current requirement of >462 lumens and note that:

- lower light output increases the risks of household dissatisfaction with light quality; and
- typical LED downlights will achieve 500 lumens at 7 Watts.

Action four – expand the options for lighting upgrades to include ‘lamp only - ELV’ retrofits where there is currently a magnetic transformer installed.

The 2016 Rules amendments included welcome changes that allowed ELV halogen downlight lamps with electronic transformers be replaced with a compatible LED lamp (no replacement of a transformer required). The rule amendments however stopped short of allowing direct lamp replacements of ELV halogen downlights lamps that are connected to magnetic transformers. Essentially ESS support in these instances still requires a complete lamp and transformer changeover. With this consultation, if current proposals are adopted ACPs will have a new option to install a 240V Self Ballasted lamp in place of an existing lamp/magnetic transformer. A welcome Rule change which Embertec support.

However, we still maintain that more should be done and the ESS Rule Tables E1.1 and proposed Table E1.2 should be amended to allow ‘*Tungsten halogen Lamp (ELV) with Magnetic Transformer or Infrared coated (IRC) halogen Lamp (ELV) with Magnetic Transformer, with or without Luminaire*’ be replaced with compatible ‘*LED lamp only – ELV*’.

It is not clear why this change was not adopted with last year’s suite of Rule changes when there is a range of high quality and safe ‘plug and play’ LED downlight products available and compatible with magnetic transformers. We presume that the basis for continuing to not allow these upgrades is as risk adverse response to an old preconception that:

- existing magnetic transformers used with halogen downlights are widely not compatible with new LED technology therefore leading to rash of lamps that perform poorly or worse fail completely if installed; and that
- an LED lamp may lead to a transformer failing prematurely (or vice versa) or, in the worst case, overheating, potentially causing a fire.

As we described in our previous submission last year, a number of years ago, when the technology was first available, the above concerns might have had some merit. Now however, driven by the stringent product specifications and testing requirements required for inclusion in the VEET program, LED manufacturers have innovated to meet the challenge and designed new and better

products that are compatible with most existing halogen transformers. Victoria would now have more than 7 million lamp only retrofitted downlights installed¹ into in excess of 300,000 homes² and the scheme administrator has not publically reported any level of unacceptable failure rates. For perspective, in conjunction with our accredited partners Embertec's has installed more than 1,000,000 'plug and play' lamps into 50,000 households that are supported with a 2-3 year warranty – to date the current product failure rate is 0.3%. This level is well within the boundaries of what could be expected for failure of standard halogen downlight installation.

We are confident that any concern over long-term compatibility of 'plug and play' LED downlight installed into fittings with magnetic transformers is overstated. The Victorian experience with these types of products should provide a high level of reassurance to the Department that they are also suitable for homes in NSW and acceptable for installation under the ESS.

It is also important to highlight the significant benefits that 'plug and play' products provide back to the consumers, including:

- **Low cost installation** – on average, for an experienced electrician, a direct swap of the downlight lamp takes less than two minutes. By comparison, for an electrician to remove and replace a transformer (which often requires ceiling access) the job will typically average 7 – 8 minutes. On a job that requires 20 lamps replaced that equates to an additional (and often unnecessary) two hours on site – leading to significant installation costs.
- **Lamp end of life** – from a consumer perspective changing a home lamp when it has reached end of life should be easy and straightforward, 'lamp only' replacements offers that for the household, no electrician required. Note also that these products will typically last longer than 15 years in a residential environment, by which time it is not likely that any halogen products would be available for sale.
- **LED downlight costs have dropped quickly** – a range of different products are readily available through retail outlets such as Ikea, Bunnings, Masters, and even Aldi that are not subject to the scrutiny or requirements of an ESS approval. By supporting 'plug and play' products in the ESS the NSW Government have an opportunity to add another level of rigour

¹ VEET Register of VEECs, Essential Services Commission online
<https://www.veet.vic.gov.au/Public/PublicRegister/Search.aspx>

² VEET Register of Activities, Essential Services Commission online
<https://www.veet.vic.gov.au/Public/ActivitiesPostcodeSearch.aspx>

to LED downlight product quality as well as safety (through installation by an electrician) for NSW homes.

From an ACP marketing and delivery/installation perspective this is a critical issue to address because (as we discovered in our NSW trial) consumers have zero idea about whether or not they have magnetic or electronic transformers in their roof and for most, there is no way to know until a qualified electrician arrives on site. Therefore, ACPs have to either:

- engage in a very confusing conversation about types of transformers and why some types need replacing and why others don't as well explain away potential price increases depending on what types of equipment is currently installed; OR
- build into the offering price a buffer to cover instances where electricians arrive on site and discover all the transformers need to be replaced.

Neither option is a good experience for consumers, the electricians, or the ACPs. Instances such as these also have inevitable downstream effects including delaying and/or rescheduling of future jobs and consumers simply changing their mind and deciding they don't want the upgrades. At the end of the day, the one thing consumers can confidently inform you of is that they have halogen downlights and they want to have them replaced.

Amending the ESS Rules to allow a lamp only installation option in instances where there is a magnetic transformer will afford ACPs operating under the HEER an significant overhead reduction through lower marketing/customer acquisition and installation costs.

To expand on this important detail, consider the history of LED downlight replacement in the VEET scheme under the 21D category. Before the product costs of compatible 'lamp only' options dropped to the point where it became viable to offer a "free" option to consumers, and before the quality of the 'plug and play' lamps was sufficient to make such an offer viable from a support perspective, there was a concerted effort primarily by two large APs to make the 21D activity work. Both APs (Embertec's partner was one) tried many different offerings but ultimately the high costs of marketing and acquisition associated with the activity resulted in limited penetration of the activity to households. In addition the households that did take up the offer tended to have high disposable incomes so most of the marketing efforts tended to target high socioeconomic neighbourhoods. In the absence of a 'lamp only – ELV' replacement option in VEET we estimate that (even with the better abatement values) the best case scenario would have seen LED downlights

retrofitted into only about 7 – 10% of Victorian households. It would have been an activity that by and large would have only been taken up by the wealthy and based on our trials in NSW that outcome too would be the best case scenario.

Now consider VEET today, ‘plug and play’ products are of excellent quality and costs have dropped significantly to make a LED downlight retrofit available free of charge to consumers across Victoria. Naturally, the opportunity to offer a “free” product and service (installation) has dramatically reduced the marketing and installation costs for APs offering downlight replacements. As a result it is now possible to leverage the reduced costs to offer solutions beyond a simple ‘plug and play’ lamp to solutions including full lamp and transformer replacement and dimmer upgrade options to a wider demographic.

The results of our NSW trial are included in Attachment A. Our experience provides a clear example of how the available option to provide a low cost ‘lamp only – ELV’ lighting upgrade can improve the conversation with households, drive customer engagement and deliver alternative energy efficiency lighting upgrades beyond “free” that can be tailored to meet household needs.

Action five – make changes that would achieve deeper retrofits

Since the HEER method was first introduced one of its key objectives was to push ACPs and households to think beyond installation of a single efficiency upgrade and take on multiple opportunities or “bundling” in a single transaction. The utopia situation being that a single ACP could play the role of a de-facto project manager for a home coordinating a number of different specialist companies and tradesman to complete a wide range of works. The reality is that it is not realistic to expect that different organisations with different skill sets, business networks, and tradespeople belonging to different trade unions would collaboratively work together. Complicating this reality is that from an ACP perspective the prospect of playing the coordinator role comes without a clear benefit.

Nonetheless, the HEER method still maintains an advantage compared with other state energy efficiency schemes in meeting this objective by way of the pre-existing requirement to undertake

site assessments³. To improve the engagement even further as well as meet the desired outcomes of “bundling” multiple activities during a single upgrade, we strongly recommend that more individual activities be made available for ACPs and households/SMEs to access. Specifically activities that would easily compliment lighting upgrades such as draught proofing and next generation stand-by power controllers. While acknowledging the prospect that ‘Sampling PIAM&V’ may ultimately become a vehicle for introducing new deemed activities to the HEER method there does not appear to be any initiative by the Government to expand the suite of offerings that can be accessed or to even consider different types of emerging technologies. We understand that the Government may have concerns and questions around viability and persistence of new technologies installed under the scheme. Embertec’s position is that direct dialog addressing any real or perceived issues with product manufactures and ACPs is an essential step. For manufacturers, product quality and business reputation is just as critical as scheme reputation would be for the NSW Government. Collaborative efforts to address and account for concerns is the way to move forward and for the ESS scheme new types of deemed activities need to be evaluated, and introduced on a consistent basis. Without new activities we will forever be in the current state of consulting on amendments to existing Rules without the scheme ever picking up on new innovation in technology and incentivising its delivery to end users. To that end Embertec looks forward to engaging and demonstrating some of our new technologies to OEH during 2017.

A second option that would complement introducing additional deemed activities targeted at addressing the project and administrative complexity for ACPs in taking on the role of “coordinator” is through the introduction of a bonus to ACPs for delivering more than just one activity. Essentially incentivise ACPs to achieve the government objective of “engaged consumer through deeper retrofits” by rewarding them as opposed to the current strategy of applying an arbitrary prerequisite cost (\$90 residential/\$5MWh SME) on the consumer. Embertec would make staff and resource available to OEH to explore what such a design would look like.

³ Please note, in taking this view we also assume that completing the site assessment and uploads with the HEAT tool will be simple. We have no information (or shared experiences) that would indicate that it will be a simple process. It is critical – especially when a licenced tradesperson is required to complete it – that the HEAT assessment is not complicated and does not takes a long time to complete otherwise the installation costs will increase substantially and can render an activity uneconomical quickly. Any requirement for a task to be performed by a licenced tradesperson where that task could safely be done by another adds unnecessary actual and administrative costs to an activity.

Part 2 – Responses to OEH consultation questions

The remainder of this submission sets out Embertec’s responses to the specific questions included in the consultation paper.

Section 2 – General ESS Rue

2.1 Data Requirements

Question 1 - Is the proposal to require Electricity and Gas Savings data at an Activity Definition level for the HEER and HEAB sub-methods reasonable?

No, Embertec do not believe it is reasonable at this point in time. This proposal is potentially introducing another level of administration and overhead costs to ACPs. It is doing so against an activity that has zero participation, is already complex, and includes a number of barriers already. While Embertec agree that transparency is essential and that there could be scheme benefits by improving the types of data being collected, we pose the question “why not wait until there is participation in these sub-methods and then identify gaps?” That is to say our view is that this requirement should come after or at minimum in parallel to NSW making genuine amendments (which we are appealing for in this submission) not add to the complexity. Additionally, we don’t view it necessary to introduce clause 6.8 (l) as a statutory requirement when it is arguably a more natural fit and likely would already be an existing evidentiary requirement of the scheme administrator under exiting clause 6.8 (m).

Question 2 – Do you think Electricity Savings and Gas Savings data should be reported at an Activity Definition level for the SONA and ROOA sub-methods?

Not necessarily, the rationale for not having to report it is reasonable but it would introduce data reporting requirement inconsistency across activities that may advantage SONA and ROOA methods to the detriment of HEER and HEAB.

Section 3 – Project Impact Assessment with Measurement and Verification Method

3.1 Effective Range

The proposed change to Effective Range to be +/- 5% of the difference between maximum and minimum measured values for each Independent Variable is appropriate

3.2.1 Eligibility Requirement

Question 3 – Are these proposed requirements reasonable and sufficient?

The proposed requirements are sufficient. The requirements allow the ACP considerable scope to determine appropriate eligibility requirements and representativeness tests, within the necessary constraint that these must be supported by an M&V Professional.

Question 4 – Should the business classification also be included in the minimum Eligibility Requirements, or is End-Use Service sufficient?

We do not believe that there is any need to include business classification in the minimum Eligibility Requirements. Even the inclusion of End-Use Services as a minimum requirement is unnecessary in our opinion. In general, the definition of the RESA, along with the Site Constants, will fully define the available energy savings. For example, if the RESA is to replace AC motors with DC motors, this clearly cannot be undertaken if there are no installed AC motors. If the Site Constants are the annual operating hours and the size of the motor, the available savings are fully defined without any artificial requirement to specify equipment type or business classification.

In every case the Eligibility Requirements must be deemed appropriate by an M&V Professional. If for some reason, installed equipment type or business classification are essential to determine eligibility, separate from simply the scope to perform the RESA, the M&V Professional will include these in the Eligibility Requirements.

3.2.2 Representativeness

3.2.3 Measurement and statistical requirements

Question 5 – Is the measurement and statistical requirement for Regression Analysis when using the PIAM&V sampling sub-method reasonable?

In regards to the requirement that the Coefficient of Variation of the energy consumption over the Measurement Period be less than 15%, our preference would be to see the value increased to 30% for this new methodology. The introduction of sampling makes application of the method to residential and SME sites feasible. In such sites, individual human behaviour has the potential to have much greater impact. Applying the 15% requirement may be too stringent to overcome human behavioural impacts on energy use and at least initially this requirement should be reduced to project that are targeted at the residential and SME sectors.

Question 6 – Is the requirement for the minimum number of Sample Sites to be 6 times the number of Site Constants appropriate?

A specific requirement such as this has the potential to limit the scope of application of the method, or the accuracy of the chosen model. The appropriateness will depend on the nature of each Site Constant and the relationship of that Site Constant to the energy consumption. The ACP should be accorded latitude to depart from the requirement, with appropriate explanation from an M&V Professional.

3.2.4 Bias

3.2.5 Normal year

Section 4 – Metered Baseline Method

4.1 NABERS for Hospitals

Question 7 – Is the proposal to expand the ESS Metered Baseline NABERS sub-method to include hospitals appropriate?

5. Deemed Energy Savings Method

5.1.1 Equipment Requirements and product approvals

Embertec support the amendments to Rule 9.2A.

This would appear to allow the scheme administrator greater discretion to stipulate product requirements beyond what is legislated in the Rules. On the assumption that scheme administrator will only apply these powers where there is a need, it should help ensure that high quality products get installed under the scheme. This too would presumably allow ACPs and product manufacturers to work directly with the scheme administrator outside the statutory rules to amend product requirements in a manner that would better serve the scheme.

5.1.2 Purchaser Co-payment

Question 8 – Are there changes to ESS Rule requirements around the purchaser co-payment that could meet the objectives of consumer engagement and quality lighting outcomes while reducing red tape and compliance costs?

The first point to make is that to date there is no evidence that would indicate the ‘Purchaser Co-payment’ actually works to support the Government’s objectives of “ensuring that consumers are engaged with the project, and to help ensure customers receive quality products that are fit for purpose”. There is no evidence that customer disengagement or product quality are problems. This Co-payment requirement is a fix to a problem that may not exist, but may have existed in the past under GGAS where poor quality and wrong colour spec CFL’s were randomly distributed without being installed. The co-payment appears to be a completely arbitrary figure that adds unnecessary confusion and costs to ACPs and consumers alike.

Our recommendation is to remove the requirement for a co-payment by striking Rule 9.4.1(e) and 9.8.1 (g).

Below in Box 1 is the excerpt from Embertec’s submission to the ESS Rule amendment consultation in November 2015 in regards to this topic. We maintain that the points made one year ago remain valid and add that our own learned experiences while conducting real life trials of a HEER business model further substantiated our position. The co-payment requirement together with the existing (low) Electrical Savings Factors attached to LED downlight retrofits simply does not offer a compelling proposition for the consumer. This is despite what the NSW Government highlighted in the 2015 consultation paper as an \$850 savings over \$10 years for simply replacing 10 halogen downlights with LED products. Please refer to our confidential Attachment A to this submission for additional details showing the financial metrics and return on investment outcomes from our NSW trials.

Box 1 – Recommendation rationale to remove the co-payment requirement (Nov 2015)

Remove the \$90 co-payment

The ESS is a market based scheme, at its core, it is predicated on the basis that the market will determine what the most cost effective uptake of energy efficient activities will be. By pushing a minimum \$90 household contribution there is not only a financial barrier being put in place but the effect can also start to erode the benefits intended to be delivered by the scheme in the first instance.

At face value this requirement seems contrary to the intentions of the scheme. As we understand the rationale, the co-payment is legislated with the expectation that it will both drive household engagement and push them to consider the more “high value” (read capital intensive) activities as well as remove any prospect that business models could emerge that could result in households being provided with and having products installed free of charge (give-aways).

Our first point is to remind the Department that the market sets the price. If a market price supports businesses being able to offer product and/or services free of charge, this should be permitted and indeed welcomed. It is after all a market. If the concern is around scheme reputational risks through the emergence of low quality installations and/or that undesired business models will emerge with give-aways, then address the concerns appropriately by other means. As a starting point we recommend:

- Each ACP be required to disclose **confidentially** their customer acquisition process to IPART on a regular basis and models change. This would provide IPART visibility of high risk business models and would among other things allow them to complete targeted auditing of businesses that use unsolicited contact (door knockers and outbound call centre).
- For ACPs make it part of the Terms of the Accreditation that they sign an Undertaking to implement and respect the requirements of the DNC register.
- For ACPs make it part of the Terms of the Accreditation that they sign an Undertaking to meet the provisions within Australian Consumer Law concerning unsolicited consumer contracts including a commitment to allowable contact hours for door knocking and outbound calling.
- Provide IPART with the teeth to penalize and/or suspend ACPs that fail meet any Undertaking. The advantage of this system is that breaches of the DNC and ACL legislation which would be insufficient to provoke action from the regulators of that legislation, but which are sufficient to be of serious concern to IPART, can be dealt with firmly and rapidly.

Second point, the provision of energy efficiency activities free of charge to consumers is not inherently a bad outcome for consumers or for the scheme. So long as there are sufficient safeguards, penalties, and reporting in place to address and mitigate any real or reputational risks. Where activities are appropriate to be provided free to consumers, large numbers of consumers can benefit from immediate cost benefits. Halogen downlight replacement is such an activity, which can yield immediate savings of hundreds of dollars annually, with no downside for the consumer. Such outcomes enhance the reputation of the scheme and lead to greater consumer interest in other energy efficiency activities.

Third point, it is acknowledged that the ESS allows the Scheme Administrator the discretion to remove the co-payment for households participating in a prescribed low income program. However, this situation only supports households that actually want to access a low-income program and are eligible to do so. There will be many disadvantaged households that will not want to participate in a program aimed at “the poor” that will find the process too cumbersome, or will not understand how to participate in the program. It is likely that for many otherwise eligible households, these burdens will prove nearly as great a barrier to entry as the co-payment. There are also a significant and increasing number of households that, while they do not meet the criteria to be considered disadvantaged, live payday to payday, for whom the \$90 co-payment is a significant hurdle. We reiterate, for the many households that don’t have the available capital, an ESS market capable of supporting a free offering is a good outcome.

5.2 Sale of New Appliances

5.2.1 Adjustment to the SONA Equipment Energy Savings

Question 9 – Do you agree with the proposal to update the SONA Equipment Energy Savings tables?

Embertec support this proposed amendment, using updating the deemed energy savings tables in-line with more recent sales data sets is appropriate.

5.3 Commercial Lighting

5.3.1 Air-conditioning Multipliers

Question 10 – Are the percentages of cooling season and heating season reflective of an average of how often buildings across NSW are in cooling and heating mode respectively?

48% (heating) and 91% (cooling) appear reasonable but it is curious that the preferred approach is to apply a single value to all of NSW when the mix would vary depending on different climate zones in the state. Presumably the approach is preferred because the overall differences may not be that material and maintaining a single value keeps the calculation simple. The big change here however is on the potential impact on lighting upgrades because the multiplier itself is moving from 1.3 down to 1.07. This is a significant change that may make some lighting opportunities fall into the unviable category. however we will support it as we recognise this change is in response to stakeholder feedback, the rationale for the new figures is appropriate, and too that the change brings alignment of the AC multiplier in the ESS scheme to a level much more aligned to the of the Victorian VEET scheme value of 1.05.

5.3.2 Control Gear for fluorescent lamps

Question 11 – Do you agree with the proposed amendments to Table A9.2?

Embertec support this simplification of the Rule

5.4 Public Lighting Energy Savings Formula

Question 12 – Do you wish to be part of a target consultation on potential rewording of Clause 5.4(c) in order to make this clear?

5.5. Home Energy Efficiency Retrofits

5.5.1 Definition of Small Business Building and Residential Building

Question 13 – Do you agree with amending the definition for Small Business Building to allow Energy Savings to be calculated for BCA class 5, 7b and 8 buildings? If not please indicate why and provide us with an evidence base to support your justification.

Question 14 – Do you agree with amending the definition for Residential Building to allow Energy Savings to be calculated for BCA class 4 buildings? If not please indicate why and provide us with an evidence base to support your justification

For both questions 13 and 14 Embertec support the changes. Applying BCA classifications to every real-life situation can be challenging, particularly when trying to apply the BCA classification for end uses, it is often is an uncertain science. This amendment seems to appear reasonable and appropriate by providing more inclusive support to the variety of dwellings that exists.

5.5.2 Small Business Building default savings factors

Question 15 – Do you agree with the following? If not please indicate why and provide us with an evidence base to support your justification:

- *Provide separate Electricity Savings Factors for Small Business Buildings based on 4,200 operating hours in Activity Definitions E1, E4 and E5.*
- *Provide a separate Deemed Activity Electricity Savings equation based on 3,000 operating hours in Activity E11.*
- *Provide separate Electricity Savings Factors for Small Business Buildings based on 3,000 operating hours for 'LED Lamp only – ELV' replacements in Activity Definition E1 and E3.*
- *Provide separate Electricity Savings Factors for Small Business Buildings based on 1,000 operating hours in Activity Definitions E2*
- *Provide a Lifetime deeming period of 10 years for Small Business Buildings.*

The end result of this change, which includes a much improved Electricity Savings Factor for small businesses, is welcome and without questions a more representative figure of the true benefits energy savings. This is a genuine change that will likely provide far greater support to the SME sector

and could initiate activities under the HEER method but only in delivery of energy efficient lighting to SMEs. Simultaneously as we support this, seeing this type of focus and improvement to support SME is equally frustrating to know that similar efforts are not being put forward for the residential sector. We have already laid out a number of changes that we believe would help the residential sector engage further with the ESS scheme so will not restate them again. We will add one additional comment, which is to remind the Government that scheme costs are passed on to the residential sector too. The longer it takes to include the mom and dads of the state the greater the risk the scheme will be critically judged as simply a government imposed cost that offers no direct benefits. In a real sense Government is propagating a scheme reputation risk on themselves by not taking steps (similar to those being delivered to the SME) to substantive changes targeting the residential sector.

5.5.3 ELV Halogen to 240V LED

Question 16 – Do you agree with the proposal to expand Activity E1 to allow Energy Savings to be calculated when replacing an ELV halogen downlight with a 240V LED?

Embertec agree with this proposal and agree that it closes an unnecessary gap in the type of lighting upgrades that could potentially be offered to the end users. As we have discussed in detail earlier in Part One of this submission the other critical gap that need to be updated is to allow 'Lamp only – ELV' retrofits to existing halogen downlights with magnetic drivers.

5.5.4 Replacing a T8 or T12 Luminaire with a LED Luminaire

Question 17 – Is the proposal to replace the 10W banding in Table E5.1 with 5W banding appropriate?

This proposal is reasonable, Embertec view the more granular categorisation of lamp circuit power categories an improvement to the activity.

5.6 High Efficiency Appliances for Businesses

5.6.1 Installing a New High Efficiency Air-conditioner in Small Business Buildings

Question 18 – Do you agree with the proposal to expand the eligible BCA classification under the HEAB sub-method?

The consultation paper states “It is proposed to allow Small Business Buildings generate Energy Savings under Activity Definition F4, and under the HEER sub-method”. It is presumed that SME would have the opportunity to choose between either F4 or the HEER sub-method but the way it is being described is unclear on if the intent is to allow double counting of energy savings by allowing SME to claim the benefit using both approaches simultaneously. There may be other provisions in the Rules that restrict this but please clarify. Otherwise, on the presumption that it is an either or situation we support the expanded BCA classification.

Conclusion

With more appropriate business drivers downlight retrofits would be the most effective path to supporting residential activity in the ESS. The Victorian is delivering for residential and to the extent possible should be replicated in NSW. Additionally, because Victoria has had wide spread deployment of new lighting technologies the infrastructure and expertise to deliver to residential sector already exists. Appropriate changes to the ESS will see Victorian AP business expand their operations quickly into NSW creating employment opportunities as well as an extension of capabilities to existing ACPs currently delivering lighting upgrades to commercial.

Thank you for the opportunity to provide comment, we look forward to further dialog with OEH to work through barriers and resolve the key shortcomings that are handcuffing the ESS from delivering more to residential.

Attachment A – Embertec NSW trial results

Separately submitted on a Commercial in Confidence basis