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**Office of Environment and Heritage**

Manager Energy Projects

Operations and Programs Branch

NSW Department of Industry – Division of Resources and Energy

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**Re: NSW Energy Savings Scheme – Rule Change Amendments 2015**

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 Amendments (2015)'.

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 into research and development. Embertec has a number of residential lighting products approved for use in the ESS scheme and has extensive experience as a supplier of those products for installation under the South Australian REES Scheme, the Australian Capital Territory's Energy Efficiency Improvement Scheme (EEIS), and the Victorian Energy Efficiency Target (VEET) scheme. Embertec has also been the largest facilitator of Victorian Energy Efficiency Certificates (VEEC) in VEET since 2011.

We commend the efforts of the NSW Government and its Departmental staff in their ongoing commitment to improving the ESS scheme. This suite of proposed amendments is a welcomed and positive step forward in supporting the NSW Government's final positions outlined in the ESS Review Position Paper. There are a number of changes across the ESS Rules that this consultation is seeking feedback on and in general our view is that many of the amendments proposed are well considered and will result in genuine improvements for the scheme. However, we take a critical view of the proposals regarding the 'Home Energy Efficiency Retrofit' (HEER) despite the positive steps to improve method. We remain

sceptical that the amendments (as proposed) will be sufficient to result in significant scaling of activities in the residential sector.

The ESS Review Position Paper and discussions held directly with staff from the Office of Environmental Heritage (OEH) confirmed that there is a determined commitment to remove the barriers preventing Accredited Certificate Providers (ACP) from establishing business models structured to support the HEER method. Additionally, while much of our interaction with OEH staff is recent, it is clear that there is a genuine desire for more engagement and a keen interest to work with existing and potential ACPs (particularly those with experience in other jurisdictions) to collaborate and drive the improvements.

Our detailed response to the consultation paper is included in Attachments A and B to this letter. While there are a number of changes being proposed in the consultation document the focus of our response is to communicate remaining barriers (particularly as they relate to downlight replacement) and offer options that if implemented will likely drive participation by the residential sector (using the HEER method) in the ESS. 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 ACP 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. 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 10 years for Lifetime does not encourage installation of the suite of high efficiency products now available that will last more than 25,000 hours.

- **Establish savings factor “bands” for residential lighting products** – Products with high efficacy and long lifetimes are increasingly available, or able to be developed, but this higher quality comes at a cost. If there is not, there will be a race to the bottom on quality, it is important to recognise and reward manufacturers, ACPs and households that innovate, source and install high efficacy, long lasting products. Higher performing products that are rewarded with higher abatement scores will most likely be installed, leading to customer satisfaction and persistence of savings.
- **Allow installation of compatible “plug and play” downlight lamps** – 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 lamp only LED downlight products available in Australia now that meet stiff government specifications and have undergone rigorous testing to establish compatibility with existing halogen transformers (both magnetic and electronic). Large numbers of such lamps have been installed in Victoria with very few problems.
- **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.

In putting forward our submission we recognise that the impacts of our proposals will be best illustrated with a set of evidentiary data. As such Embertec have constructed business costs models for your consideration and are submitting them as a separate Commercial in Confidence Attachment B. Attachment B is being provided for the sole purpose of illustrating the actual costs involved in delivering energy efficient lighting to residential households. Importantly it contains real data and other business sensitive information from our operations in Victoria that must remain out of the public domain.

We also take the opportunity to 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 the following individuals:

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We look forward to continued discussions,

Yours,

Henry Otley

## Attachment A – detailed response to ESS Rule Change Amendments

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## 1. Introduction

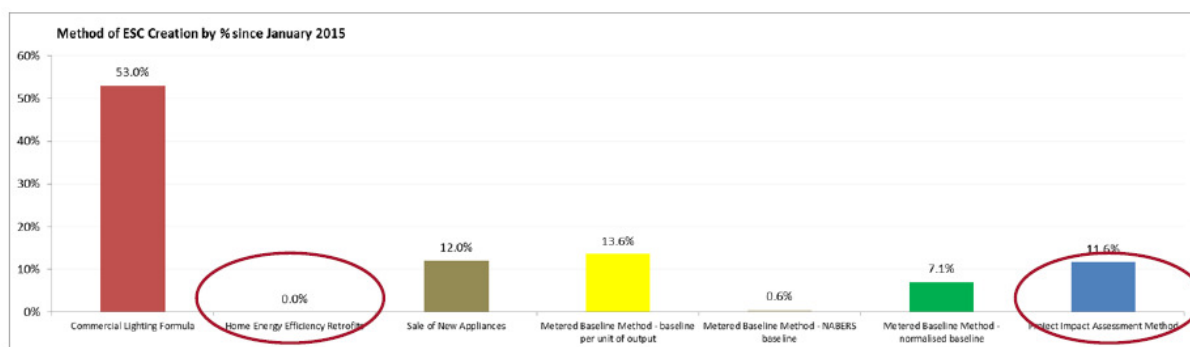
In putting forward this submission it is recognised that the Department through the Office of Environmental Heritage (OEH) is seeking stakeholder feedback to the November 2015 Consultation Paper on proposed amendments to the ESS Rules. There are a range of proposals put forward and they include a broad scope of changes that will apply globally across the scheme and others that are specifically targeted to improve access to the ESS for households and businesses. In general the proposals are consistent with the recommendations included as part of the ESS Review Position Paper.

Generally, we take the view that the proposed amendments are a positive step forward in supporting the NSW Government's final positions outlined in the ESS Review Position Paper. However, as a prospective product supplier and ACP with long term success in both manufacturing and delivering quality energy efficiency products and services to the residential sector the most relevant and valuable perspective to this consultation we can provide is in response to the Home Energy Efficiency Retrofit (HEER) method. As such our comments are directed specifically towards improvements to the HEER.

## 2. Improve the ESS to better serve the New South Wales residential sector

The ESS scheme has recently legislated new and increasing targets to 2019. The new targets will be challenging to meet and were set with the expectation that the scheme would begin to better service the residential sector. Figure 1 from OEH clearly highlights the disparity between residential sector and the non-residential sector under the ESS program in 2015.

Figure 1 – Certificate creation in the ESS in 2015 (source: OEH)



Source: OEH 2015, 'NSW Energy Savings Scheme' presentation to the Energy Efficiency Council National Conference

The HEER method has had zero participation to this point despite it having been created as a specifically residential solution and to be the primary method to facilitate affordable retrofits. As the consultation paper identified the costs to businesses to participate under current rules are too high. The high costs have led to the complete stagnation seen in Figure 1 and significant level of missed opportunities to improve the financial position and quality of life for households. To borrow the example used in the consultation paper:

*a household taking up cost effective energy efficiency activities can reduce their energy use by up to 20%. "by replacing 10 halogen downlights with more efficient LEDs, a household could save about \$850 on their electricity bills over the course of 10 years".*

The statement clearly establishes that the NSW Government is keenly aware of the missed opportunity. To continue to borrow the lighting example and to reinforce the missed opportunity further, Table 1 demonstrates the total penetration and dollar savings taking place in Victorian households converting to LED downlights (through VEET) compared with NSW (through the ESS).

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

<b>Rented</b>	582,000	827,299
<b>Assumed proportion of homes w/ downlights</b>	60%	60%
<b>Total opportunity (for owner occupied)</b>	817,200	986,400
<b>Homes transitioned to LED downlights (through EE program)</b>	≈208,000 <sup>a</sup>	≈130 <sup>b</sup>
<b>Proportion of eligible homes with LED downlights</b>	25%	≈ 0%
<b>Annual \$ savings (assume \$85/annum/home)</b>	\$17,680,000	11,050
<b>\$ savings over 10 years for households (assume \$850/home)</b>	\$176,800,000	110,500

In fairness it must be stated that the dollar savings reported in in Table 1 are very conservative. An average home with downlights has around 20 and current lifetime of the majority of LED products being installed in Victoria is more than 25,000 – 30,000 hours.

In addressing the issue the NSW Government has put forward changes to the HEER method aimed at reducing costs and increasing participation. While we do view the proposed changes to the HEER method as welcome improvements, we do not hold the view that the specific amendments proposed to the HEER will significantly improve access to the scheme for households.

Our modelling (included in Attachment B) indicates that for ACPs completely committed to delivery of energy efficiency lighting upgrades to households they would service less than 10% of the residential opportunity. The modelling assumes that the proposed amendments are adopted without any other supporting changes to the Rule and are grounded in actual business delivery metrics that we understand intimately through our own experience over the past two years of providing low energy downlight solutions to homes in Victoria. The amendments may prove to simplify the process to use the HEER method but do not dramatically improve the business fundamentals to support residential better. For lighting, the certificate benefit will be immaterial in comparison to the costumer acquisition/marketing costs required. The sales price will ultimately need to be at a level beyond the willingness to pay for most households.



The value and the benefit that energy efficiency provides to both households and community at large are well established and it is clear that NSW wants to do more. Nonetheless – using the LED downlight retrofit example – despite value of \$850 savings for households being easily accessible, a viable business delivery model has not yet presented. 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.

To be clear, we recognise that the Department through OEH has made it a priority to improve the HEER method and have at least put forward a set of amendments that should make it simpler to participate, including:

- amending the current bundling and site assessment requirements;
- allowing gas savings and fuel switching activities; and
- Introducing a GLS LED lighting activity.

Despite the changes, in our view many of the ESS fundamentals, including the need for a co-payment and energy savings factors applied toward lighting upgrades are limiting the potential of the ESS to support NSW residential. We request the Department to push forward with the proposed changes so that business models become viable and the ESS can finally be the spark needed for households to grab hold of the \$850 (and more) that is readily available now.

### **3. Improve access to lighting upgrades as priority**

Lighting is a crucial gateway activity to increased awareness of the benefits of energy efficiency. It tends to be a low cost/high value opportunity that is most often cited as in the first instance in conversations about energy efficiency. Lighting upgrades are also the most tangible opportunity to introduce energy efficiency value to those that don't understand it well. Lighting retrofits done well using licenced electricians and high quality products return benefits to the household that are immediate and quantifiable in deep dollar savings and also raised awareness of energy use.

NSW should look at the example being set by Victoria where LED lighting is delivering real value to households by the hundreds each day. An increasing proportion of the our daily contact with customers are with those (9.2% over the past two months) already served who now recognise the dollars they have saved and are looking for other ways to take up energy efficiency. This is taking place organically on the back of lighting upgrades and is something that lighting will deliver to NSW assuming the right ESS incentives are available. However, as our modelling in Attachment B demonstrates the incentives are not sufficient at present to make the business case viable for either the consumer or a participating ACP.

An advantage of the HEER is that in our opinion a lighting retrofit to a NSW consumer is likely to create a more highly engaged customer compared with Victoria because of the pre-existing requirement to undertake site assessments (which does not exist in Victoria). To improve the engagement even further as well as meet the desired outcomes of “bundling” multiple activities during a single upgrade, we would strongly recommend that more activities be made available as part of the program. Please note however, 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 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. 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.

#### **4. 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. 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 be commercially viable. Additionally the approach results in a situation where there is no incentive to source and/or offer higher quality and longer lasting products to households. Indeed this provides a perverse incentive, where ACPs who are prepared to provide the lowest possible quality are encouraged while ACPs who provide quality products stay out of the market.

We strongly recommend that the NSW Government move to an energy saving calculation approach similar to that used in the Victorian Energy Efficiency Target (VEET) that categorises and classifies the energy savings factor (ESF) 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 10 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.

The business proposition and financial implications of not improving the energy savings factors in line with the product specifications are detailed in Attachment B. The ideal solution would be for NSW to pick up and use the VEET abatement factors for its 21D and 21E activities – again we have modelled in Attachment B the business case if this were adopted<sup>1</sup>.

To adapt the VEET requirements to the NSW format we propose the scheme move to energy savings matrix similar to the Table 2.

The most important element in order for the replacement of halogen downlights in residential premises to become economically viable is for the ESF to accurately reflect the true lifetime savings from the activity by replacing the 10 year assumed life used for calculating the ESF with the actual expected life of the LED. The proposed scheme encourages the installation of higher quality, longer life LEDs by providing lifetime bands with associated ESFs. This approach will increase the ESF for higher quality longer life LEDs, making their installation economically viable.

Should an individual LED lamp fail before the rated lifetime, the energy savings will not in any case be lost. The failed lamp will in most instances be replaced with a similar product, either under warranty, or by the consumer themselves. It is not possible to replace a failed  
The second element of the VEET scheme which we propose be adopted is to provide for

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<sup>1</sup> For your reference included in Appendix are the proposed VEET abatement values for 2016 which are currently open to consultation.

recognition of efficacy. Efficacy can be considered to be light output divided by lamp circuit power. Recognising efficacy encourages the installation of LEDs having the same light output with lower energy use.

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

<b>Activity Energy Savings</b>						
<i>Deemed Activity Electricity Savings = Savings Factor</i>						
Where:						
<ul style="list-style-type: none"> <li><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</li> <li><i>Lamp Efficacy Circuit Power</i> is the Efficacy Circuit Power of the replacement Lamp and Driver being installed (in Lm/Watt)</li> </ul>						
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	LED Lamp and Driver or CFI	15,000 to 20,000				
		20,000 to <25,000				
		25,000+				
Tungsten halogen Lamp (ELV) with Magnetic Transformer or Infrared coated (IRC) halogen Lamp (ELV) with Magnetic Transformer.	LED Lamp and Driver or CFI	15,000 to 20,000				
		20,000 to <25,000				
		25,000+				
Luminaire with Tungsten halogen Lamp (ELV) and Electronic Transformer, or Luminaire with Infrared coated (IRC) halogen Lamp (ELV) and Electronic Transformer.	LED Luminaire - recessed	15,000 to 20,000				
		20,000 to <25,000				
		25,000+				

Luminaire with Tungsten halogen Lamp (ELV) and Magnetic Transformer, or Luminaire with Infrared coated (IRC) halogen Lamp (ELV) and Magnetic Transformer.	LED Luminaire - recessed	15,000 to 20,000				
		20,000 to <25,000				
		25,000+				
Tungsten halogen Lamp (240V)	LED Lamp only – 240V Self Ballasted or LED Lamp and Driver or CFLi	15,000 to 20,000				
		20,000 to <25,000				
		25,000+				
Tungsten halogen Lamp (240V) and Luminaire	LED Luminaire – recessed or CFLi with Luminaire	15,000 to 20,000				
		20,000 to <25,000				
		25,000+				

### Proposed adjustment to minimum lumen requirements

The rationale for moving the specification from 'New End-User Equipment must have an initial Downward Light Output >500 lumens' to '>385 lumens' is not well established. The rationale proposed seems to be more an administrative fix to account for the existence in the market of low lumen downlights. If the change is expected to increase the opportunity for NSW households to access energy savings, our experience would indicate that it will have little impact. The additional lamps allowed into the scheme by lowering the standard will have insignificant advantages in terms of either increased energy savings or reduced price. Embertec offer a range of different products with different downward lumens but no household has ever requested a product at levels at or around 385 lumens for a downlight. Customers by and large want the best quality light available and for those that want low lumens, the preferred option they take up is to add a dimmer switch to their order.

Our experience in the Victorian market during 2013 was that customers complained of reduced light quality compared to the replaced halogen lamps when supplied with LED replacement lamps with lumen output less than 450 lumens and a beam angle lower than 55 degrees. Since upgrading our range in 2014 to exclude these lower performing lamps, we have not had one complaint from consumers regarding light quality. As a point of reference, we offer lamps with a lumen range from 565 lumens for our entry level product up to 910 lumens for our high end premium 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 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 initial downlight light output requirement of 500 lumens remain unchanged 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.

## **6. Expand the options for lighting upgrades to include ‘plug and play’ products**

Currently the ESS only provides support for LED retrofits in households for complete lamp and transformer changeover (in the VEET scheme this activity is commonly known as a 21D installation). It is not clear why complete lamp/transformer changeovers are the only option when there is a range of high quality and safe ‘plug and play’ LED downlight products available. We presume that the basis for this requirement is an old preconception that:

- existing electronic and magnetic transformers used with halogen downlights are 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, in the worst case, overheating, potentially causing a fire.



Three to four 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 4 million plug and play downlights installed<sup>2</sup> into in excess of 180,000 homes<sup>3</sup> 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 400,000 'plug and play' lamps into 20,000 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 replacement is without merit. 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.

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 minute. By comparison, for an electrician to remove and replace a transformer (which often requires ceiling access) the job will typically average 7 – 8 minutes.
- **Lamp end of life** – from a consumer perspective changing a home lamp when it has reached end of life should be easy and straightforward, 'plug and play' offers that for the household, no electrician required.
- **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

<sup>2</sup> VEET Register of VEECs, Essential Services Commission online  
<https://www.veet.vic.gov.au/Public/PublicRegister/Search.aspx>

<sup>3</sup> VEET Register of Activities, Essential Services Commission online  
<https://www.veet.vic.gov.au/Public/ActivitiesPostcodeSearch.aspx>

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

If the ESS is not able to sufficiently support ACP businesses with the delivery and installation of high quality long lasting low energy lamps it runs a significant risk that there will be an increasing number of households simply look to do it themselves using cheap products that are actually poor performing. Through the ESS scheme the NSW has a great opportunity to reduce that risk.

The preference for Energy Savings Factors for this new category is that the OEH use the Victorian VEET 21C model (and existing abatement factors) which categorises lamp products based on efficacy and lifetime. As previously discussed, taking this approach will reward high quality long lasting products with higher Energy Savings Factor values. For consistency to the ESS scheme we would envisage the Energy Savings table to look similar to Table 3.

Activity Energy Savings						
<i>Deemed Activity Electricity Savings = Savings Factor</i>						
Where:						
<ul style="list-style-type: none"> <li><i>Savings Factor</i>, in MWh, is the value from Table E1.1 corresponding to the existing Lamp or Luminaire where the Efficiency of the replacement Lamp being installed (in Lm/Watts); and</li> <li><i>Lamp Efficacy Circuit Power</i> is the Lamp Efficacy Circuit Power of the replacement Lamp being installed (in Lm/Watt) and is measured in accordance with Table A9.4 of Schedule A NEED APPROPRIATE TABLE.</li> </ul>						
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	LED Lamp	15,000 to 20,000				
		20,000 to <25,000				

Lamp (ELV) with Electronic Transformer		25,000+				
Tungsten halogen Lamp (ELV) with Magnetic Transformer or Infrared coated (IRC) halogen Lamp (ELV) with Magnetic Transformer.	LED Lamp	15,000 to 20,000				
		20,000 to <25,000				
		25,000+				

Included in Attachment B is the financial modelling (using actual business) demonstrating the viability and improved opportunity the addition of ‘plug and play’ LED lamps with appropriate Energy Savings Factors will deliver to NSW households.

#### Cost reduction advantages for including ‘Plug and Play option to the ESS

An important supporting benefit of ‘Plug and Play’ options is that they provide ACPs with a valuable option for reducing the marketing/customer acquisition costs for those households that may prefer the full replacement of downlight and transformer (ESS activity E1).

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 ‘plug and play’ lamps 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 ‘plug and play’ 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.

Now consider VEET today, ‘plug and play’ products are good 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 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 options (21D in VEET, E1 in ESS) to a wider demographic.

Costing details on this dynamic are included in Attachment B. A key takeaway is that this is a prime example of how the available option of a low cost 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.

## **7. Installation and decommission requirements for the ESS**

All ACPs performing efficiency upgrades should complete the work safely and should be required to dispose of any decommissioned product responsibly in a manner that demonstrates a high level of professionalism and positive stewardship to the environment. For lighting upgrades of all types including ones that involve plug and play products the works should be completed by an Electrician (all jobs) or at the very least an individual under direct supervision of an electrician.

All de-commissioned globes and transformers should be removed and recycled. The ESS should not focus solely on lamps that contain mercury, recycling should be a requirement across the scheme. We also strongly disagree with the amendment proposal for mercury recycling that makes a safe disposal requirement only applicable to postcodes subject to the Metropolitan waste levy areas listed in Table A25 of the ESS Rule. Our experience is that recycling is not a barrier for energy efficiency upgrades in regional areas but instead an important part of providing a quality service to consumers.

As an example our partners when operating in remote regional areas will ship product to installers (licenced electricians) who obligated under contract to ensure a one-for-one reconciliation of used globes are shipped back to headquarters in Melbourne. All shipping

costs are borne by the business and considered a prudent cost of business for operating in VEET.

Requiring recycling also protects the reputation of the ESS. There is a community expectation that Government programs such as this will be conducted on sound environmental protection principles; informal dumping of large caches of removed devices into the household waste stream will not enhance the reputation of the scheme.

Further from an operational and scheme administrative perspective the accounting involved with decommission products provides an important piece of evidentiary support that the installation was completed correctly and that the documentary evidence submitted to IPART is an accurate representation of the works completed.

## **8. Bundling activities in HEER**

Since the HEER method was first introduced one of the key objectives in developing it was to push ACPs and households to think beyond installation of a single efficiency upgrade and take on multiple opportunities or “bundling”. 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. It is simply not realistic to expect that different organisations with different skill sets and tradespeople that belong to different trade unions would collaboratively work together. From our own perspective facilitating such interaction would be very challenging and come at significant cost to our operations without a clear benefit.

A simpler and proven successful approach to bundling has been established in the energy efficiency schemes in the ACT and South Australia. Their model can easily be replicated in NSW through introduce a wider selection of activities for households that compliment lighting retrofit. Draught sealing for instance definitely compliments lighting upgrades nicely and another activity that has proven to be a viable product to bundle in the ACT and South Australia is Stand-by Power Controllers (SPCs).

We understand that the Department may have concerns and questions around persistence SPCs may. We suggest that energy savings scores can be adjusted accordingly to account for removals and also advise that the latest generation of SPCs include new innovation that goes a long way in addressing concerns. While discussions to include SPCs is out of specific scope of this consultation, Embertec intend to engage with the Department to address any concerns and demonstrate the value that they can bring to consumers and the scheme.

## 9. Conclusion

With more appropriate business drivers downlight retrofits would be the most effective path to supporting residential activity in the ESS. As far as you can bring the Victorian model to NSW, it has worked and has delivered a measurable dollar savings to consumer in the State. 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 as well existing NSW lighting business change focus from commercial to residential.

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.

## Appendix A – Current regulations and proposed amendments for VEET 21C and 21D

For OEH reference, we have included the VEET 21C and D activity specifications including the current specifications and proposed amendments to the abatement factors for each. All the tables have been sourced from the Victorian Department of Economic Development, Jobs, Transport and Resources consultation document 'Victorian Energy Efficiency Target – Proposed Activity Regulation Changes October 2015' available online

[http://www.energyandresources.vic.gov.au/energy/about/legislation-and-regulation/energy-saver-incentive#utm\\_source=energyandresources-offline-marketing&utm\\_medium=vanity-url-301ssredirect&utm\\_content=esi&utm\\_campaign=energy](http://www.energyandresources.vic.gov.au/energy/about/legislation-and-regulation/energy-saver-incentive#utm_source=energyandresources-offline-marketing&utm_medium=vanity-url-301ssredirect&utm_content=esi&utm_campaign=energy)

### VEET Schedule 21C – Installation of low energy 12 volt lamp to replace 12 volt halogen

Table 3 – Proposed equipment specification changes

Current Requirements	Proposed Requirements	Reason for change
Minimum lighting source efficacy of 25 lumens/watt.	Minimum lighting source efficacy of 52 lumens/watt.	Higher efficacy provides for more efficient lighting.  95% of lamps installed through the VEET scheme in the last year were 52 lumens/watt or better.
Minimum light output of 350 lumens in the forward direction.	Minimum light output of 420 lumens in the forward direction.	Higher light output provides better customer acceptance.  More than 99% of lamps installed through the VEET scheme in the last year could achieve this.
Minimum rated lifetime is 8,000 hours.	Minimum rated lifetime is 15,000 hours.  Add a 25,000 hour plus category.	Longer lifetimes provide greater energy savings and improve customer acceptance.

		All approved products are 15,000 hours plus and good quality LEDs should have a lifetime of at least 25,000 hours.
Minimum beam angle of 36 degrees.	Minimum beam angle of 50 degrees.	A wider beam angle is more appropriate in residential lighting applications.  73% of products installed and 95% of the models installed in the VEET scheme in the last year could achieve this.

Table 9. Current certificate allocation for Schedule 21C – Installation of low energy 12 volt lamp to replace 12 volt halogen

Table 4 - Current certificate allocation for Schedule 21C – Installation of low energy 12 volt lamp to replace 12 volt halogen

Rated Life of Low Energy Lamp (Hrs)	Abatement Factor					
	Minimum Efficiency (25 lm/W)	High Efficiency 1 (30 lm/W)	High Efficiency 2 (36 lm/W)	High Efficiency 3 (43 lm/W)	High Efficiency 4 (52 lm/W)	High Efficiency 5 (62 lm/W)
8,000 to < 10,000	0.20	0.24	0.27	0.29	0.31	0.33
10,000 to < 12,000	0.25	0.30	0.33	0.36	0.39	0.41
12,000 to < 15,000	0.30	0.35	0.40	0.44	0.47	0.50
15,000 to 20,000	0.37	0.44	0.50	0.55	0.59	0.62
20,000 +	0.50	0.59	0.67	0.73	0.78	0.83

Table 5 - Revised certificate allocation for Schedule 21C – Installation of low energy 12 volt lamp to replace 12 volt halogen

Rated Life of Low Energy Lamp (Hrs)	Abatement Factor			
	Minimum Efficiency (52 lm/W)	High Efficiency 1 (62 lm/W)	High Efficiency 2 (75 lm/W)	High Efficiency 3 (90 lm/W)
15,000 to 20,000	0.44	0.47	0.49	0.51
20,000 to < 25,000	0.59	0.63	0.66	0.68



25,000 +	0.74	0.78	0.82	0.85
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## VEET Schedule 21D – Installation of mains voltage low energy downlight in place of existing 12 volt halogen downlight

Table 6 - Proposed equipment specification changes for 21 D

Current Requirements	Proposed Requirements	Reason for change
Minimum lighting source efficacy of 40 lumens/watt.	Minimum lighting source efficacy of 48 lumens/watt.	Higher efficacy provides for more efficient lighting.  All currently approved lamps could meet this.
Minimum light output of 350 lumens in the forward direction.	Minimum light output of 400 lumens in the forward direction.	Higher light output provides better customer acceptance.  70% of products and 90% of models installed through the VEET scheme in the last year could achieve this.
Minimum rated lifetime is 8,000 hours.	Minimum rated lifetime is 15,000 hours Add a 25,000 hour plus category.	Longer lifetimes provide greater energy savings and improve customer acceptance.  All but one of the currently approved products are 15,000 hours plus and good quality LEDs should have a lifetime of at least 25,000 hours.
Minimum beam angle of 36 degrees.	Minimum beam angle of 40 degrees.	A wider beam angle is more appropriate in residential lighting applications.  72% of the products installed and 84% of the models installed through the VEET scheme in the last year could achieve this.

**Table 7 - Current certificate allocation for Schedule 21D – Installation of mains voltage low energy downlight in place of existing 12 volt halogen downlight**

Rated Life of Low Energy Lamp (Hrs)	Abatement Factor				
	Minimum Efficiency (40 lm/W)	High Efficiency 1 (48 lm/W)	High Efficiency 2 (58 lm/W)	High Efficiency 3 (69 lm/W)	High Efficiency 4 (83 lm/W)
8,000 to < 10,000	0.30	0.32	0.34	0.35	0.36
10,000 to < 12,000	0.38	0.40	0.42	0.44	0.45
12,000 to < 15,000	0.45	0.48	0.51	0.53	0.54
15,000 to < 20,000	0.56	0.60	0.63	0.66	0.68
20,000 +	0.75	0.80	0.84	0.88	0.90

**Table 8 - Revised certificate allocation for Schedule 21D – Installation of mains voltage low energy downlight in place of existing 12 volt halogen downlight**

Rated Life of Low Energy Lamp (Hrs)	Abatement Factor				
	Minimum Efficiency (48 lm/W)	High Efficiency 1 (58 lm/W)	High Efficiency 2 (69 lm/W)	High Efficiency 3 (83 lm/W)	High Efficiency 4 (100 lm/W)
15,000 to 20,000	0.46	0.48	0.50	0.52	0.53
20,000 to < 25,000	0.61	0.64	0.67	0.69	0.71
25,000 +	0.76	0.80	0.83	0.86	0.88