ACT Government

ACT ENERGY EFFICIENCY IMPROVEMENT SCHEME (EEIS)

STAKEHOLDER CONSULTATION ON 2016 ACTIVITIES UPDATE

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1. INTRODUCTION

As part of the ongoing process of strengthening the ACT Energy Efficiency Improvement Scheme (EEIS) , the Territory is seeking your input on draft proposals for new and updated energy savings activities under the Scheme.

This paper sets out:

- the context, scope and objectives for these potential changes
- a summary of the key proposed changes and rationale
- the stakeholder submission process and questions

Note that all proposals in this paper are draft for stakeholder consultation and will not take effect until the Scheme regulatory instruments are formally amended and announced.

Following stakeholder consultation the Territory will finalise and update the subordinate legislation and administrative processes to include new and updated activities in the Scheme. We will consider your feedback on these changes before any amendments are made to activities.

2. STAKEHOLDER FEEDBACK

The Territory is seeking stakeholder feedback on the proposed changes summarised in this paper and discussed in our public consultation forum on 28 April 2016. The slides from presentations at the forum will be available at http://www.environment.act.gov.au/energy/smarter-use-of-energy/energy_efficiency_improvement_scheme_eeis

A summary of the changes to each activity is described in this paper below. Stakeholders should also consult the relevant sections of the current Activity determinations and code of practice. These are available online at: http://www.legislation.act.gov.au/a/2012-17/li.asp

There are a number of particular issues on which the Territory is seeking stakeholder feedback as part of this consultation. These are set out in the evaluation form distributed at the Stakeholder Forum and found at the survey monkey link from the EEIS home page (http://www.environment.act.gov.au/energy/smarter-use-of-energy/energy_efficiency_improvement_scheme_eeis).

Please provide your confidential response on the feedback form either using the hard copy distributed at the forum, or the survey monkey link above, or email EPD-EEIS@act.gov.au by **12pm on Monday 9 May.** Submissions received after this time may not be considered.

3. BACKGROUND TO THE 2016 EEIS ACTIVITY UPDATE

EEIS OVERVIEW

The *Energy Efficiency (Cost of Living) Improvement Act 2012* (the Act) establishes the Energy Efficiency Improvement Scheme (EEIS). The EEIS places legislated obligations on energy retailers in the ACT to invest in activities which help ACT energy customers save energy.

The Objects of the Act are to:

- encourage the efficient use of energy; and
- reduce greenhouse gas emissions associated with stationary energy use in the Territory; and
- reduce household and business energy use and costs; and
- increase opportunities for priority households to reduce energy use and costs.

The Act is supported by a number of legislative instruments, providing for Scheme targets, Tier 2 Contributions and eligible activities as well as comprehensive codes of practice relating to requirements for undertaking activities and keeping records.

EEIS EXTENSION

The EEIS commenced in 2012 and, following a legislated review in 2014, was extended to run until 2020. This recognises the significant success of the EEIS to date and the potential that remains to implement cost-effective energy savings in ACT households and businesses.

The key elements of the EEIS extension until 2020 are to:

- maintain momentum on ambitious, but achievable targets for low cost and high electricity and gas savings. Households and businesses should see a decrease in their energy bills as a result of energy efficiency improvements;
- deliver economic benefits of nearly $40 million in Net Present Value to the ACT economy (as modelled for the 2015 Regulatory Impact Statement);
- give even greater certainty to energy retailers about their obligations under the Scheme; and
- increase participation and business opportunities by harmonising the ACT system with those of other jurisdictions.

2015 STAKEHOLDER FORUM

Following the extension of the Scheme, an EEIS Stakeholder Forum for energy retailers, activity providers and others was held on 3 September 2015. Forum goals were to:

- share information about what the EEIS has delivered so far;
- share opportunities for retailers and new abatement providers to deliver activities that deliver greenhouse gas emission abatement; and
- invite stakeholders to help shape the EEIS's future by contributing ideas in workshops.

Many of these findings helped set the priorities and direction for this 2016 activity update. In particular these include:

1. developing codes of practice to enable current activities (such as exhaust fan sealing) to be implemented;
2. reviewing and updating where required the assumptions and the Approved Abatement Values (AAVs) for current activities in light of:
   - ACT's world leading 90% renewable energy target, and
   - regulatory and market changes which may affect savings;
3. expand the range of potential activities available;
4. improve harmonisation with other state schemes;
5. explore the potential to allow certificates from the NSW and/or Victorian schemes to be used by ACT retailers to meet obligations;
6. ensure sufficient priority group benefit;
7. reduce the cost of savings to improve cost-benefit ratio of the EEIS by:
   - increasing Tier 2 retailer participation,
   - increasing 3rd party provider participation, and
   - reducing costs to government and participants; and
8. maintain the ACT focus by:
   - ensuring ACT only participants are not excluded, and
   - maintaining appropriate ACT quality & safety requirements.

The complete findings of this forum are detailed in a report that can be found online at: http://www.environment.act.gov.au/__data/assets/pdf_file/0004/798232/EEIS-Report-on-EEIS-Stakeholder-Forum,-3-September-2015.pdf

4. SCOPE OF THE 2016 ACTIVITIES UPDATE

The Territory commenced a 2016 update of EEIS activities to progress the extension of the Scheme and the above priorities identified by the 2015 stakeholder forum. This includes harmonisation with other jurisdictions to increase participation and business opportunities. The project is structured under four broad areas as follows:

1. Establishing systems to harmonise and integrate with other schemes.
2. Developing codes of practice, record keeping and reporting requirements.
3. Updating current activities, baselines and abatement.
4. Developing new activities.

This project aims to ensure that Scheme elements are in line with other jurisdictions and also involves liaison to confirm business opportunities, develop new activities and maximise consistency between jurisdictions. Energy efficiency experts Common Capital, in partnership with Energy Efficient Strategies and Beletich Associates, have been contracted to assist with the project.

This paper summaries the draft recommendations by the consultants on proposed AAVs and key requirements. These recommendations are supported by detailed modelling and analysis and updated draft activity determinations and codes of practice.

5. OVERVIEW OF PROPOSED CHANGES

This section summarises the key changes that are being considered to deliver the policy objectives and scope, as outlined in sections 3 and 4 above. The major changes for stakeholder consultation are:

- updates of baselines, harmonisation and streamlining for most existing activities, with increased options for space and water heating activities; and
- new activity proposals, drawing from priorities put forward in the September 2015 Stakeholder Forum. These include:
  - a new approach to activities involving the sale of high efficiency residential appliances, and
  - proposed new commercial activities.

The general changes are summarised below. Each major new proposal is detailed in section 6. A range of other activities are already under consideration and, if supported, will be progressed in the future. These include, but are not limited to, insulation, aggregated metered baseline and other business activities.

5.1 PROPOSED UPDATES TO EXISTING ACTIVITIES

As part of the 2016 EEIS activity update, the consultants reviewed the appropriateness of AAVs and requirements for existing activities. Activities were reviewed in light of current ACT regulatory, market, climate zone conditions as well as harmonisation with other schemes and streamlining objectives.

The major changes proposed are:

Activity	Key proposed changes
Residential building envelope upgrades	• Updated AAVs based on ACT emissions intensity factors, climate zones and stock data
Residential space heating and cooling upgrades	• Updated AAVs based on ACT emissions intensity factors, climate zones and stock data • New matrix approach to allow broader range of new and old equipment combinations
Residential hot water services upgrades	• Updated AAVs based on ACT emissions intensity factors, climate zones and stock data • Harmonisation with VEET • Additional options for fuel switching, inclusion of heat pumps suitable for cold climates
Residential lighting upgrades	• Updated AAVs based on ACT emissions intensity factors • Harmonisation with VEET

Activity	Key proposed changes
Activities to save energy from existing residential appliance and equipment	• Updated AAVs based on ACT emissions intensity factors, stock data • Harmonisation with VEET • Updating removal of old refrigerators requirements to cover a wider range and age of older products, based on likely characteristics size as size and age
New residential appliances	• Updated AAVs based on ACT emissions intensity factors, stock data • Proposed new approach for measuring abatement for the sale of new appliances

The main issues addressed in the baseline updates are summarised below.

THERMAL PERFORMANCE MODELLING

Many current EEIS factors relating to building shell improvements and heating or cooling upgrades utilised modelling analysis undertaken specifically for the VEET scheme. The ACT baselines were assumed to be comparable to the "Ballarat" climate zone coupled with a Victorian building stock profile. In this update, thermal simulation analysis was undertaken based on the Canberra climate zone (NatHERS 24)[1] using a housing stock profile based on the ACT[2] rather than for Victoria.

COOLING STOCK/LOAD ASSUMPTIONS

Many current EEIS factors are based on modelling which assumed that 100% of ACT households own cooling equipment. This is incorrect, ABS 4602 indicates an ownership of closer to 70% in 2011. The current modelling for the ACT also applies a discount factor to cooling loads of 71% based on an approach used by VEET. There was no basis for this discount and VEET has subsequently removed this discounting from its calculations. The ACT modelling has been brought in line with VEET.

REBOUND ASSUMPTIONS

For many activities under the current EEIS scheme there is an assumption that rebound[3] will occur and that it will continue to increase over the life of the product (effectively a compounding rate of rebound has been applied). Effectively this significantly discounts the assumed lifetimes' savings from many activities. In the few cases where rebound is included, assumptions have generally been aligned with those applied under the VEET scheme in this update.

1. ACT has a similar temperature profile to Ballarat but receives significantly more direct solar radiation
2. The mix of housing types in the ACT is somewhat different to that in Victoria with less lightweight construction and somewhat better insulation levels due to mandatory performance requirements for new homes since the early 1990s.
3. Typically, when estimating the benefits of a proposed energy efficiency program, there are concerns that the expected savings may not be fully realised due to the fact that consumers may choose to take part of the potentially available savings in the form of a higher level of service this is known as the 'rebound' effect. This effect pre-supposes that service levels are less than optimal at the time of the particular intervention, which in a first world country such as Australia has somewhat limited applicability.

5.2 A NEW APPROACH TO ACTIVITIES INVOLVING THE SALE OF HIGH EFFICIENCY RESIDENTIAL APPLIANCES

The Territory is seeking stakeholder feedback on a potential new approach for the sale of new high efficiency residential appliances. This approach would replace the existing activities for the purchase of new high efficiency fridges, freezers, dryers and televisions. It would also include new activities for the sale of new high efficiency clothes washers and dishwashers.

Through preliminary stakeholder consultation and reviewing these existing activities, the Territory identified policy risks with existing approaches and proposed a new method to overcome these risks.

EXISTING APPROACHES FOR NEW APPLIANCE ACTIVITIES

From a harmonisation perspective, there are two different ways in which Australian schemes provide incentives for the installation of new high efficiency residential appliances. These are:

1. savings/abatement awarded for the *purchase* of new high efficiency appliances.
2. savings/abatement awarded for the *sale* of new high efficiency appliances.

The former approach is adopted in VEET and was previously used in the ESS. The latter approach is used in the ESS.

Both approaches use very similar methods for calculating energy savings. These methods calculate savings as the difference between the energy used by the new appliance and the market average for new appliances of that type.

The key difference in the methods is for the purchase of appliances, evidence must be provided that a named, individual householder purchased the appliance. For the latter, evidence must be provided that an appliance retailer sold the appliance. The former is significantly more complex and costly to collect.

ISSUES WITH EXISTING APPROACHES FOR NEW APPLIANCE ACTIVITIES

Under either method, the monetary value of abatement is typically in the range of 2 to 5% of the cost of most appliances (and up to 10% for some new TVs). For most of these appliances this value is too small to provide an incentive for consumers to take up new activities. In some instances, the cost of obtaining consumer signatures can exceed the value of the incentive. For these reasons, this activity has seen extremely low levels of take-up in all jurisdictions since 2009. There has been no take up of this activity in the EEIS.

To overcome these issues, the ESS moved to a sales-based approach. This approach requires appliance retailers to provide evidence of all eligible appliance sales by type and rating. Savings are then calculated and awarded at an aggregate level by retailer. The costs of calculating abatement in this way are very low. While incentives per individual appliance are low, the aggregated subsidy per retailer can be substantial.

A concern to the Territory is that introducing this method into the EEIS would allow appliance retailers to receive substantial subsidies from energy customers for carrying out their business as usual activities. In this way, the method effectively allows 100% freeriding, then partially compensates for it by discounting the recognised abatement through high baselines. Under the proposed method appliance retailers could sell exactly the same

number of high efficiency appliances as they would anyway, and be rewarded for it, crowding genuinely additional abatement activities out of the EEIS.

The Territory understands the significant impact that high efficiency appliances can have in reducing household bills and emissions. But both the established methods have material risks. For this reason the Territory is seeking stakeholder feedback on a potential third way.

PROPOSED NEW APPROACH

The Territory is seeking stakeholder feedback on a potential new approach, which aims to combine the additionality of the first method with the efficiency of the second. This approach would also be a sales-based approach, gathering aggregated data at an appliance retailer level. However, to ensure additionality this approach would only reward retailers where they implement initiatives that drive sales of high efficiency appliances that exceed the sales-weighted market average.

Under the current sales-based methods, appliance retailers receive credit for every high efficiency appliance they sell. Under the proposed new method the weighted efficiency of high efficiency appliance sales would be considered alongside the weighted efficiency of low efficiency appliance sales. Only if the sales-weighted average efficiency for the individual retailer exceeded the sales-weighted market average efficiency would savings be rewarded.

In this way the proposed method would prevent free riding: business as usual activities would create no abatement. The proposed method retains the low administrative costs of the ESS appliance sale method, with very similar reporting requirements for a different calculation method.

More importantly, this method can help aggregate and direct EEIS funding at scale to programs that drive high uptake of high efficiency appliances. For example, funding could be used to drive new sales force training initiatives or commission structures to more effectively promote high efficiency appliances. With sufficient incentive, retailers could potentially go further and require suppliers to put high efficiency components in lower cost appliances, driving step improvements in efficiency.

Further details on this draft proposed approach and issues for consideration are set out in Section 6.6.

5.3 PROPOSED NEW COMMERCIAL ACTIVITIES

In addition to updating existing activities, a key goal of this review is to introduce new activities which will increase the range of savings projects implemented. The Territory is considering a range of potential new residential and commercial activities. This section summarises the initial set of new activities on which the Territory is seeking feedback.

Work is continuing on developing additional new activities (such as high efficiency refrigerated display cabinets) and the Territory will consult on these at an appropriate time.

The key new activities covered in this consultation are:

- an EEIS standalone commercial lighting method;
- an ESS integrated commercial lighting method; and
- an ESS integrated commercial M&V based method.

The Territory is proposing to introduce two parallel pathways to claiming abatement from energy saving commercial lighting upgrades in the ACT. This approach has been developed in response to stakeholder feedback and following extensive agency level consultation with Australian jurisdictions.

EEIS STANDALONE COMMERCIAL LIGHTING METHOD

The first pathway is a standalone EEIS method. The proposed approach is based closely on REES method, which in turn is closely harmonised with the NSW Energy Savings Scheme (ESS). It would be administered in the same way all current EEIS activities are administered: delivered by retailers in accordance with approved compliance plans. Providers wishing to implement lighting upgrades would need to contract directly with an energy retailer.

This pathway, proposed AAVs and major specifications are set out in more detail in Section 7.1.

AN ESS INTEGRATED COMMERCIAL LIGHTING METHOD

The second proposed pathway has been developed in recognition that for many Tier 2 retailers and third party providers, scale is a barrier to direct participation in the EEIS.

This alternate pathway is based on near complete integration with the ESS for specified activities. This would streamline the administrative efficiency and simplicity for the Territory, retailers and providers, while assuring abatement, product and installation quality.

Under this proposed new approach, the Territory would enter into agreements with the NSW Government to closely cooperate on scheme policy and administration. Key aspects of this cooperation would include:

- enacting mutual recognition provisions under current ESS and EEIS legislation;
- establishing a capacity to create a new class of ESS energy savings certificates (ESC) for activities implemented in the ACT (ACT ESCs);
- enhancing ESS registry, compliance and reporting systems, accreditation and audit processes to manage ACT ESCs and share information with the Territory; and
- establishing an ACT register of providers.

In very simple terms the process would work as follows:

- providers wishing to implement commercial lighting upgrades in the ACT could become accredited under the ESS or use their existing ESS accreditations;
- the savings from commercial lighting projects implemented in the ACT would be used to create ACT ESCs under current ESS assurance and compliance processes;
- ACT retailers could obtain ACT ESCs and apply an ACT emissions intensity conversion factor to calculate the corresponding EEIS AAV; and
- ACT retailers could then transfer these ACT ESCs to the Territory to contribute towards their obligations, in accordance with their compliance plans.

As an additional safeguard on top of existing ESS assurance processes, the Territory would establish a capacity to independently approve and suspend individual providers from operation in the EEIS. It is envisaged that the process for approval and compliance for providers would be streamlined with ESS accreditation and that suspension would occur as a last resort.

ACT based lighting firms who do not wish to become accredited, could participate by subcontracting to ESS accredited certificate providers (ACPs). Established ACPs typically have already invested in the systems required for certificate creation, compliance and trading, but would require local contractors for project implementation.

The proposed AAV calculation method and issues for discussion are set out in Section 7.2.

AN ESS INTEGRATED COMMERCIAL M&V BASED METHOD

It is also proposed to extend this process to savings projects that use the ESS Project Impact Assessment with Measurement and Verification Method (PIAM&V).

PIAM&V is a type of savings calculation method sometimes referred to as project based assessment (PBA). PBA methods differ from the approach used for other current EEIS methods, which are based on pre-calculated, average, default abatement factors (DAFs) for narrowly specified activities.

DAF based methods are based on four general components:

- rules about which activities are eligible;
- assumptions on annual baseline energy consumption, before the activity is implemented;
- assumptions on annual operating energy consumption after the activity is implemented; and
- the expected "persistence" of savings in years, based on which lifetime abatement is "deemed".

Project based assessment methods are based on the same four components as DAFs. The principle differences are that PBAs set out detailed rules for measuring baseline and real world operating conditions and energy consumption and statistical analysis for calculating savings for each specific project. PBAs are activity neutral and are governed by overarching eligibility rules as to what constitutes an additional energy savings activity within scheme rules.

From a policy perspective, PBAs represent a more rigorous approach to ensuring abatement is awarded for real energy savings than DAFs. DAFs have traditionally been preferred by policy makers and industry because they are simpler and potentially lower cost to use.

However, there is a finite range of energy saving activities for which it is possible to develop robust DAF methods. Schemes across Australia, including the EEIS, have adopted *almost* every activity for which DAFs can credibly be developed. There are many cost effective energy savings opportunities for which DAFs are not appropriate. To access these savings opportunities, the EEIS and other schemes need to adopt PBA based methods.

The NSW ESS has been a national leader in PBA methods, including and refining them since its inception. The Emissions Reduction Fund and REES have adapted several ESS PBA methods, and VEET is in the process of developing new PBA methods derived from ESS methods. PIAM&V is the most flexible of ESS PBA methods.

Because of their increased complexity, assurance is more complex. PBA methods require checking not only of eligibility and measurements, but also that the measurements were done in an appropriate way and that the statistical analysis was appropriate. This means that a scheme administrator needs different capabilities for PBA methods. Given the relative scale of the EEIS compared with ESS or VEET, it is not feasible to cost effectively administer a standalone EEIS PBA methodology.

For these reasons, PIAM&V has been identified as a priority to develop an ESS integrated method. This method would be very similar to the above ESS integrated commercial lighting method. The only key difference would be the use of a different emissions intensity factor for converting ACT ESCs to EEIS AAVs. This different factor is required because of the different deemed lifetime assumptions behind PIAM&V calculated ESCs and the lower ACT emissions intensity due to the renewable energy target.

The proposed AAV calculation method and issues for discussion are set out in Section 7.3.

6. PROPOSED NEW AND UPDATED RESIDENTIAL ACTIVITIES

6.1 RESIDENTIAL BUILDING ENVELOPE ACTIVITIES

ACTIVITY DESCRIPTION

BUILDING SEALING ACTIVITIES

(Part 1.1), exhaust fan sealing (Part 1.2) and ventilation opening sealing (Part 1.3) are unchanged[4] at this stage.

Part 1.4 - Install a thermally efficient window:

- The proposed activity definition no longer requires that a minimum 5m^2 of window be replaced, but it does require that the space to which the window is to be installed be a conditioned space.
- Eligibility: Whilst the product must still be WERS rated, only its U value (max. = 4.0) and its Solar Heat Gain Coefficient (SHGC - min. = 0.4) are now relevant. The actual WERS rating is no longer a consideration.

Part 1.5 - Retrofit thermally efficient glazing

- Amendments as per part 1.4 above plus:
  - Films are no longer permitted, only glass, acrylic or polycarbonate;
  - The product must now be "simply removable by the home owner so as to permit access to the formed air gap for cleaning/drying purposes".

Part 1.6 - Install thermally efficient window coverings & Part 1.7 - Install window pelmets

- Only the ascribed AAVs have been amended – see below:

DRAFT AAVs BY ACTIVITY

Part	Activity	Abatement Factor (tCO_2-e)
1.4	Install a thermally efficient window	= ((-0.0737 * U_W) +0.8984) * A
1.5	Retrofit thermally efficient glazing	= ((-0.04541 * U_W) +0.5495) * A
1.6	Install thermally efficient window coverings	= 0.17 * A
1.7	Install window pelmets	= 0.1 * A

Where:

UW = The total U value for the window system (as certified under WERS) – max. = 4.0

A = the area of the installed thermally efficient window (m^2), measured from the outside of its frame to the nearest centimetre or in the case of window coverings and pelmets the area of the pre-existing window.

4. Activities that relate to building sealing are to be the subject of a separate future analysis to be undertaken for the Victorian VEET program by TI consulting.

DEEMING PERIOD BY ACTIVITY

Part	Activity	Deeming Period (Years)	Based on
1.4	Install a thermally efficient window	25	VEET
1.5	Retrofit thermally efficient glazing	15	VEET
1.6	Install thermally efficient window coverings	10	Existing
1.7	Install window pelmets	10	Existing

HARMONISATION WITH OTHER SCHEMES

Part	Activity	AAVs	Product Requirements
1.4	Install a thermally efficient window	ACT specific [1]	VEET [2]
1.5	Retrofit thermally efficient glazing	ACT specific [1]	VEET [2]
1.6	Install thermally efficient window coverings	Nil [3]	Nil [3]
1.7	Install window pelmets	Nil [3]	Nil [3]

Note 1: New continuous function developed based on ACT specific modelling – see above
Note 2: Based on VEET requirements but with modifications as noted in the activities definitions above
Note 3: No other schemes include these activities

SKILLED INSTALLER REQUIREMENTS

Appropriately trained tradespeople

RATIONALE FOR KEY CHANGES

Parts	Change	Rationale
1.4 & 1.5	Removal of 5m^2 limit to window area	The previous limitation was not needed, and could unnecessarily limit uptake of this activity
1.4	Required to be undertaken in a conditioned space	Savings can only be realised if the space in which the activity is undertaken is conditioned
1.5	Films no longer permitted	Films are not robust, can be easily damaged, can suffer seal failure and cannot easily be removed for cleaning purposes. Anecdotally, homeowners have been known to remove the product because of these shortcomings
1.5	Product must be simply removable by the home owner	This is necessary so as to permit access to the formed air gap for cleaning/drying purposes (e.g. to remove condensation)
1.4 & 1.5	WERS rating no longer a consideration	In the ACT the most significant factor affecting window performance is the windows total U value. A 4 star WERS rated window could have a U value ranging from 6 to less than 1, therefore, greater certainty of outcome is assured by using the total U value to determine the expected savings
1.4 & 1.5	Minimum SHGC requirement	So as to avoid the use of highly reflective glazing that could compromise important solar heat gains in the winter an upper limit of 0.4 has been specified for the SHGC. Very low SHGC glazing can also reduce natural light and increase the use of artificial lighting.

ISSUES TO CONSIDER

In line with VEET assumptions, no rebound or additionality allowance has been included for these activities. Whilst rebound is unlikely where relatively small installations are undertaken or where the home already has central space conditioning, the question of additionality is less certain, particularly in relation to window coverings, where little data are available.

6.2 SPACE HEATING AND COOLING ACTIVITIES

Under the EEIS there are currently several space conditioning activities as follows:

- Part 2.1: Replace ducted gas with HE ducted gas;
- Part 2.2: Install HE ducted gas in a new residence;
- Part 2.3: Replace ducted HP with HE ducted HP;
- Part 2.4: Replace central resistance heater with ducted HP;
- Part 2.5: Install a HE space air – air HP; and
- Part 2.6: Install insulated gas heating ductwork.

Extensive changes are proposed for these activities as outlined below. It is proposed that Parts 2.1 to 2.5 be replaced by a comprehensive matrix of options that cover a wider range of technologies as set out in the proposed activity update below.

Only minor changes are proposed to Part 2.6 (ductwork) and these will be released shortly.

PROPOSED ACTIVITY UPDATE – SPACE HEATING AND COOLING ACTIVITIES

ACTIVITY DESCRIPTION

The revised approach for EEIS is broadly as follows:

- where an existing system type is specified, it must be verified that it is decommissioned as part of the activity and the baseline savings should be calculated from the technical attributes of the decommissioned equipment;
- where an existing system type is NOT specified as part of the activity, the baseline savings should be calculated as the average new market value for the product (which is the assumed outcome in the absence of EEIS); and
- the energy savings should be calculated on the basis of the efficiency and other attributes of the specific new product installed when compared to the baseline for the activity.

In most cases, an existing system need not be specified and therefore the baseline for the activity is an average new product. The exceptions where it is recommended that an existing system be specified and decommissioned in order to qualify for an activity are as follows:

- fixed electric resistance heating (central or room) converted to anything else; and
- gas heating system (central or room) being converted to a heat pump system.

The following tables set out the recommended matrix of options proposed to replace space heating activities Part 2.1 to 2.5. These are split into central heating activities and room heating activities. All activities are scaled according to system size using a similar approach to that adopted in VEET, including assumed lifetime.

Table 1: Recommended Matrix of Central Space Heating Activities for EEIS

Code	Existing System	New System	Baseline	Lifetime	Notes
HC1	Central electric	Central heat pump	Central electric stock	13	Replaces 2.4
HC2	Gas ducted	Central heat pump	Average new ducted gas	13	New
HC3	Not specified	Central heat pump	Average new central HP	13	Replaces 2.3 + new
HC4	Not specified	Gas ducted	Average new ducted gas	14	Replaces 2.1 & 2.2

Table 2: Recommended Matrix of Room Space Heating Activities for EEIS

Code	Existing System	New System	Baseline	Lifetime	Notes
HR1	Fixed electric	Room heat pump	Fixed electric stock	12	New, any size
HR2	Gas room	Room heat pump	Average new room gas	12	New
HR3	Not specified	Room heat pump	Average new room HP	12	Replaces 2.5
HR4	Not specified	Gas room	Average new room gas	12	New

There are a number of specific changes to each of these activities in the proposed revision:

- Activities HC1, HC2 and HC3 should permit a multi-split air conditioner which meets the general requirements to be installed. These have the advantage of no duct losses and can provide equivalent or superior energy service.
- To qualify for HC1 and HR1, an existing fixed resistance electric system must be present and be decommissioned when the new system is installed. HR1 would include decommissioning of a central electric heater to be replaced with a room heat pump.
- Products that are rated for operation under H2 heating conditions (cold climate) and meet the performance requirements for AS/NZS3823.2 and include H2 data in their product registration are eligible for additional credits.
- To qualify for HC2 and HR2, the specified gas system must be present and be decommissioned when the new system is installed.
- Fuel switching from an existing electric (heat pump or resistance) to a new gas is not specified, but this can be included under HC4 or HR4.
- Cooling energy has been included for reverse cycle air conditioners – this appears as negative abatement for these products (around 10% reduction in abatement in most cases) and aligns with the approach used by VEET.

This new matrix of options for space heating under EEIS covers all existing activities (Parts 2.1 to 2.5) and also introduces some new activities that more closely align with the scope of VEET. It provides considerably more flexibility for these types of activities in the ACT.

As outlined elsewhere, the building heating and cooling loads have been revised and updated including:

- use of the Canberra climate for AccuRate simulations; and
- using building stock attributes that are representative of the ACT.

DRAFT AAVs BY ACTIVITY

Table 3 provides a summary of each sub-activity type, applicable capacity ranges, baseline efficiencies assumed and the emissions savings or AAV in terms of *t* CO_2e /kW of capacity installed (fixed and variable).

The generalised formula for abatement for heat pumps is:

Abatement Factor (t CO_2-e) = $[AAV_f + Factor + AAV_v \times (ACOP - AAV_{base}] \times Capacity$

Where:

AAV_{base} is the base efficiency factor specified in Table 3 for the existing and new product combination

AAV_f is the fixed emissions saving factor specified in Table 3 for the existing and new product combination

AAV_v is the variable emissions saving factor specified in Table 3 for the existing and new product combination

ACOP is the annual coefficient of performance (heating) of the new product as registered under AS/NZS3823.2

Capacity is the rated heating capacity of the new product in kW as registered under AS/NZS3823.2 (minimum 10kW, where the new product has a rated capacity of >30kW, 30kW is used in the equation above)

Factor is equal to 0.04 for heat pump systems that comply with H2 low temperature performance requirements in AS/NZS3823.2 and have H2 performance data recorded in their registration, 0.0 for all other systems

The generalised formula for abatement for gas appliances is:

Abatement Factor (t CO_2-e) = $[AAV_f + AAV_v \times (SRI - AAV_{base}] \times Capacity$

Where:

AAV_{base} is the base efficiency factor specified in Table 3 for the existing and new product combination

AAV_f is the fixed emissions saving factor specified in Table 3 for the existing and new product combination

AAV_v is the variable emissions saving factor specified in Table 3 for the existing and new product combination

SRI is the star rating (decimal star rating) of the new product as published in the *Directory of AGA Certified Products* as published from time to time by the Australian Gas Association under *Indirect Fired Air Heaters* (AS4556) or *Space Heating Appliances* (AS4553)

Capacity is the rated heating capacity of the new product in kW in accordance with AS4556 or AS4553 and as declared by the manufacturer and as registered with the Australian Gas Association (note that MJ/hour can be converted to kW by dividing by 3.6)

Note: The VEET Product Register records the heating capacity for gas products in kW.

Table 3: Heating Activities with Energy Savings and Activity Abatement Values (AAV)

Code	System Type	Existing System	New System	Type	Min size kW	Max size kW	Base Efficiency (AAV_{base})	Fixed Emissions Savings (AAV_f) t CO_2-e/kW	Variable Emissions Savings (AAV_v) t CO_2-e/kW/Eff	Comments
HC1A	Central	Electric panel	HP central	Ducted	10	30	3.6	1.02	0.15	3.6 ACOP baseline, replaces Part 2.4
HC1B	Central	Electric panel	HP central	Non-ducted	10	30	3.6	1.12	0.13	3.6 ACOP baseline, replaces Part 2.4
HC1C	Central	Electric slab/ducted	HP central	Ducted	10	30	3.6	1.44	0.15	3.6 ACOP baseline, replaces Part 2.4
HC1D	Central	Electric slab/ducted	HP central	Non-ducted	10	30	3.6	1.55	0.13	3.6 ACOP baseline, replaces Part 2.4
HC2A	Central	Gas ducted	HP central	Ducted	10	30	3.6	2.93	0.15	3.5 stars gas baseline, new activity
HC2B	Central	Gas ducted	HP central	Non-ducted	10	30	3.6	3.03	0.13	3.5 stars gas baseline, new activity
HC3A	Central	Not specified	HP central	Ducted	10	30	3.6	0.00	0.15	3.6 ACOP baseline, replaces Part 2.3
HC3B	Central	Not specified	HP central	Non-ducted	10	30	3.6	0.10	0.13	3.6 ACOP baseline, replaces Part 2.3
HC4	Central	Not specified	Gas ducted	Ducted	10	30	3.5	0.00	0.46	3.5 stars gas baseline, replaces Part 2.1 and 2.2
HR1	Room	Electric panel	HP room	Non-ducted	2	10	3.7	1.22	0.13	No data on H2 performance, new activity
HR2	Room	Gas room	HP room	Non-ducted	2	10	3.7	2.52	0.13	No data on H2 performance, new activity
HR3	Room	Not specified	HP room	Non-ducted	2	10	3.7	0.00	0.13	No data on H2 performance, replaces Part 2.5
HR4	Room	Not specified	Gas room	Non-ducted	2	10	3.0	0.00	0.23	3 stars gas baseline, new activity

Notes: HP central is a central heat pump system as set out in the specification. HP room is a room heat pump as set out in the specification. Emissions savings (AAV) are based on lifetime of the product as set out in the specification per kW of new installed capacity with an average emission intensity estimated across all products installed from 2016 to 2020 inclusive. An additional factor is applied for heat pumps that are certified to meeting the low temperature requirements in AS/NZS3823.2 for condition H2 (see generalised formula for abatement). Fixed emissions savings (AAV_f) are at the specific baseline for the product and variable emissions savings (AAV_v) are per efficiency unit above the relevant baseline. All AAV values are per kW of installed capacity.

HARMONISATION WITH OTHER SCHEMES

The updated activity approach is broadly in line with VEET activities as follows:

- HC1: Central electric to Central heat pump – VEET Schedule 8
- HC2: Gas ducted to Central heat pump – not in VEET
- HC3: Not specified to Central heat pump – VEET Schedule 7 plus wider cover
- HC4: Not specified to Gas ducted – VEET Schedule 7 plus wider cover
- HR1: Fixed electric to Room heat pump – VEET Schedule 10
- HR2: Gas room to Room heat pump – not covered in VEET
- HR3: Not specified to Room heat pump – VEET Schedule 10
- HR4: Not specified to Gas room – VEET Schedule 9

The baselines for the central heating products align with the approach adopted by VEET (average new market, except for specified existing systems). However, the baselines for the room heaters do not align with the approach adopted by VEET (VEET use a mixed average existing heater for all products covered by Schedule 9 and Schedule 10). The recommended approach of moving to an average new market for room heaters under EEIS, except for specified existing equipment, is more consistent and defensible and can allow many more activities to be included.

VEET has activities that encourage conversion from electric resistance to gas (e.g. Schedule 6). These activities generate zero or negative abatement in the ACT due to the low projected emission intensity for electricity so they are not included. The projected low emissions intensity for electricity in the ACT make conversion from gas to electricity an attractive option. Given the relative emission intensity in Victoria, these options are not viable in Victoria.

It is important to remember that there are some important differences in the ACT when compared to Victoria, most notably the climate and the mixture of houses that are present in the stock. Emission intensity and fuel mix is also different. Given that these parameters should be taken into account in any local scheme, there will always be some differences in the EEIS activity specifications, but the overall approach can be broadly aligned with the VEET approach in most cases.

SKILLED INSTALLER REQUIREMENTS

For all gas products a licensed plumber and gasfitter will be required. For air conditioners, installer should be licensed to handle refrigerants (where applicable) and a licensed electrician may be required where changes to wiring are made.

RATIONALE FOR CHANGES

The new matrix of options for space heating under EEIS covers all existing activities (Parts 2.1 to 2.5) and also introduces some new activities that more closely align with the scope of VEET. It also covers several options that are not covered by VEET. It provides considerably more flexibility for activities in the ACT. The inclusion of a factor to reward reverse cycle air conditioners that perform well in H2 (cold climate) heating conditions will encourage the selection of these products.

ISSUES TO CONSIDER

Under VEET, a product that is capable of both heating and cooling is assumed to provide cooling. Under Victorian climates and the Canberra climate, the cooling component of energy is relatively modest – typically around 10% of total space conditioning energy. Where an existing product is only capable of heating and this is replaced by a product that can heat and cool, the cooling energy consumed would appear as an overall reduction in the energy savings (i.e. negative savings). This tends to reduce slightly the overall energy savings when reverse cycle heat pump systems are replacing heating only systems. This element has been included to align more closely with VEET. Based on an analysis of reverse cycle air conditioners registered over the

past five years, the ratio of AEER to ACOP has been estimated at 0.96 for non-ducted systems and 0.92 for ducted systems. This is used to calculate cooling energy.

6.3 HOT WATER SERVICE ACTIVITIES

The current activities for hot water include:

- Part 3.1: Decommission and replace electric resistance water heater and install an electric boosted solar water heater;
- Part 3.2: Decommission a gas or liquefied petroleum gas water heater and install a gas or liquefied petroleum gas boosted solar water heater;
- Part 3.3 Replace an existing shower fixture outlet with a low flow shower fixture outlet; and
- Part 3.4 Hot water tap improvements.

Extensive changes are proposed for these activities as outlined below.

This section is split into three distinct product categories:

- Water heater replacements;
- Shower head replacements; and
- Tap improvements.

PROPOSED ACTIVITY UPDATE – WATER HEATER REPLACEMENTS

ACTIVITY DESCRIPTION

Part 3.1: Decommission and replace electric resistance water heater

The eligible new equipment for this activity has been expanded to now include heat pump water heaters.

Part 3.2: Decommission a gas or liquefied petroleum gas water heater

The eligible new equipment for this activity has been expanded to include electric boosted solar water heaters and heat pump water heaters.

DRAFT AAVS BY ACTIVITY

The following table sets out the revised parameters for water heater activities under EEIS. The generalised equation for calculating emission reductions for water heaters is given as:

Abatement Factor (t CO_2-e) = AAV_{base} – AAV_{Bs} × Bs – AAV_{Be} × Be

Where AAV_{base}, AAV_{Bs} and AAV_{Be} are given in Table 1 and:

Base is in GJ per year and is the average baseline that the activity effects.

Bs is in GJ/year for the model as listed in the VEET Register (solar electric and solar gas)

Be is in GJ/year for the model as listed in the VEET Register (solar electric and solar gas)

Note: The relevant VEET register for solar electric is Schedule 1E and the relevant VEET register for solar gas is Schedule 3B.

For heat pump systems:

Be = 0 (for medium size heat pump systems only)

Bs = (1 – RECs × 0.0214) × 16.67 (for medium size heat pump systems only)

Where RECs are as listed on the current Clean Energy Regulator Register of solar water heater for Air source heat pump models with capacity of up to and including 425 litres for Zone 5 (HP5-AU)

Table 4: Updated AAV values for EEIS water heater activities

Existing system	New system	AAV_{base}	AAV_{Bs}	AAV_{Be}
Electric storage	Solar electric small	4.07	0.396	0.396
Electric storage	Solar electric medium	6.60	0.396	0.396
Gas any type	Solar gas small	9.64	0.675	0.396
Gas any type	Solar gas medium	14.11	0.675	0.396
Gas any type	Solar electric small	9.64	0.396	0.396
Gas any type	Solar electric medium	14.11	0.396	0.396
Electric storage	Electric heat pump medium	6.60	0.396	0.396
Gas any type	Electric heat pump medium	14.11	0.396	0.396

Table 5 illustrates typical AAVs that could be earned by different existing system/replacement options. The average values are examples that are typical of current systems on offer, based on the current VEET Product Register.

Table 5: Sample AAV calculations earned by different existing system/replacement options

Existing system	New system	AAV_{base}	AAV_{Bs}	AAV_{Be}	Bs	Be	Sample AAV example
Electric storage	Solar electric small - average	4.07	0.396	0.396	3.0	0.15	2.823
Electric storage	Solar electric medium - average	6.6	0.396	0.396	4.6	0.14	4.723
Electric storage	Electric heat pump medium 28 RECs	6.6	0.396	0.396	6.7	0	3.954
Electric storage	Electric heat pump medium 30 RECs	6.6	0.396	0.396	6.0	0	4.237
Electric storage	Electric heat pump medium 32 RECs	6.6	0.396	0.396	5.3	0	4.519
Electric storage	Electric heat pump medium 34 RECs	6.6	0.396	0.396	4.5	0	4.802
Gas any type	Solar gas small - average	9.64	0.675	0.396	4.8	0.29	6.285
Gas any type	Solar gas medium - average	14.11	0.675	0.396	6.7	0.35	9.449
Gas any type	Solar electric small - average	9.64	0.396	0.396	3.0	0.15	8.393
Gas any type	Solar electric medium - average	14.11	0.396	0.396	4.6	0.14	12.233
Gas any type	Electric heat pump medium 28 RECs	14.11	0.396	0.396	6.7	0	11.464
Gas any type	Electric heat pump medium 30 RECs	14.11	0.396	0.396	6.0	0	11.747
Gas any type	Electric heat pump medium 32 RECs	14.11	0.396	0.396	5.3	0	12.029
Gas any type	Electric heat pump medium 34 RECs	14.11	0.396	0.396	4.5	0	12.312

Notes: Average values for solar electric and solar gas systems obtained from the VEET Product Register.

HARMONISATION WITH OTHER SCHEMES

Water heater replacement activities are mostly aligned with the general requirements of VEET with the following exceptions:

- emissions intensity for electricity and gas has been updated to reflect ACT values over the expected activity life, taking account of Renewable Energy Targets;
- because a disproportionate share of installed systems are medium size, the overall savings have been scaled by a factor of 0.7 to ensure that average hot water consumption and hot water savings are closer to the expected average during normal use; and
- heat pump water heaters must be listed and approved by the Clean Energy Regulator and must earn between 28 and 35 RECs in Zone 5 (Zone HP5-AU in AS/NZS4234). This variation takes account of the different climate in ACT.

SKILLED INSTALLER REQUIREMENTS

All water heater replacements must be undertaken by an ACT licensed plumber and gasfitter.

RATIONALE FOR CHANGES

Water heating is a significant energy user in the home. The existing specification for Part 3.1 does not include heat pumps. The existing specification for Part 3.2 does not permit fuel switching from an existing gas system to a new solar electric or heat pump system. These new options carry high abatement compared with other activities due to the projected low emission intensity for electricity in the ACT. Heat pump systems are an important option for many houses as they work in sites without suitable north facing roof space and/or significant shading.

ISSUES TO CONSIDER

- The new factor of 0.7 is proposed to keep the AAV calculation simple and is based on evidence that most systems are medium sized, both before and after the activity is undertaken.
- Zone 4 is specified for solar installations because qualifying systems will also operate well in colder, Zone 5 conditions. Zone 5 is specified for heat pumps because a few systems suffer a significant fall in performance from Zone 4 to 5 and the only way to guarantee good performance is to specify Zone 5.
- Should the Territory consider noise limits on heat pump water heaters products and, if so, how could this be effectively managed while maintaining broader alignment with the VEET product register?

PROPOSED ACTIVITY UPDATE – SHOWER HEAD REPLACEMENTS

ACTIVITY DESCRIPTION

Part 3.3 Replace an existing shower fixture with a low flow shower fixture

The activity definition is largely unchanged except that two options are now available; install a “low flow showerhead” (<9 litres/minute) or install an “ultra low flow” showerhead (< 6litres/minute

DRAFT AAVs BY ACTIVITY

Abatement Factor (t CO_2-e) = AAV × N
Where—

- AAV is the prescribed activity abatement value of 0.359 for a qualifying low flow shower head or 0.530 for an ultra low flow shower head.
- N is the number of shower fixture outlets installed in the premises with a maximum value of 2.

HARMONISATION WITH OTHER SCHEMES

Low flow shower head replacement activities are generally aligned with the requirements of VEET (Schedule 17) with some small updates and adjustments that are specific to the ACT and based on the latest data.

SKILLED INSTALLER REQUIREMENTS

Shower head may be replaced by any person who has had the specified training for this activity as set out in the code of conduct, including they must have an ACT plumbing licence.

RATIONALE FOR CHANGES

Small changes to factors such as showers per day, temperature of the shower, cold water supply temperature, ownership, number of showers per household and performance requirements have been made on the basis of the best available current data.

ISSUES TO CONSIDER

- Energy savings in homes with solar systems will be lower than for water heaters that use only gas or electricity.
- While AS/NZS4234 lists the average water temperature for Canberra as 12.1°C, some other data sources suggest that this is perhaps slightly cold. Until better data is obtained, the value of 12.1°C will be used.

PROPOSED ACTIVITY UPDATE

ACTIVITY DESCRIPTION

Part 3.4 Hot water tap improvements

This activity is proposed for removal from EEIS.

DRAFT AAVs BY ACTIVITY

The proposal is for this activity to no longer be eligible for AAVs under EEIS.

HARMONISATION WITH OTHER SCHEMES

Hot water tap improvements are not included in any other Australian scheme.

RATIONALE FOR CHANGES

The savings from these measures are very small and most taps are already fitted with aerators, so the additionality is questionable.

6.4 RESIDENTIAL LIGHTING ACTIVITIES

Note that AAVs changes below will bring the ACT scheme in line with updates delivered in VEET in April 2016. These AAV changes are not proposed for introduction into the EEIS until 2017.

ACTIVITY DESCRIPTION

The only changes contemplated to current EEIS definitions are:

- Lamp efficacy values and lifetimes are fully harmonised with VEET.

DRAFT AAVs BY ACTIVITY

Abatement factor (per lamp) is calculated as:

Abatement Factor (t CO_2-e) = AAV × PF.

Where

- PF is the power factor of the product determined in accordance with AS 4847 such that: if the power factor of the product is less than 0.9, PF has a prescribed value of 1.00; or if the power factor of the product 0.9 or more, PF has a prescribed value of 1.05.
- Proposed Consultation Draft AAVs are given in the tables below.

AAVs for 1(a) low energy GLS lamp:

Rated Lifetime (hours)	Min 40 lumens/ watt where light output is less than 350 lumens	Min 45 lumens/ watt where light output is 350 lumens or more and less than 650 lumens	Min 52 lumens/ watt where light output is 650 lumens or more and less than 850 lumens	Min 55 lumens/ watt where light output is 850 lumens or more
8000 to 9999	0.028	0.031	0.032	0.033
10000 to 11999	0.032	0.035	0.037	0.038
12000 to 14999	0.037	0.040	0.042	0.044
15000 to 19999	0.043	0.047	0.050	0.052
20000 to 24999	0.055	0.060	0.063	0.065
25000+	0.067	0.074	0.077	0.081

AAVs for 1(b) low energy reflector lamp:

Rated Lifetime (hours)	Min 45 lumens/ watt	Min 54 lumens/ watt	Min 65 lumens/ watt	Min 78 lumens/ watt
12000 to 14999	0.049	0.050	0.051	0.052
15000 to 19999	0.058	0.059	0.061	0.061
20000 to 24999	0.073	0.075	0.076	0.078
25000+	0.090	0.092	0.094	0.095

AAVs for 1(c) low energy 12V lamp:

Rated Lifetime (hours)	Min 52 lumens/ watt	Min 62 lumens/ watt	Min 75 lumens/ watt	Min 90 lumens/ watt
15000 to 19999	0.052	0.055	0.057	0.059
20000 to 24999	0.065	0.069	0.072	0.075
25000+	0.080	0.085	0.089	0.092

AAVs for 1(d) low energy downlight:

Rated Lifetime (hours)	Min 48 lumens/ watt	Min 58 lumens/ watt	Min 69 lumens/ watt	Min 83 lumens/ watt	Min 100 lumens/watt
15000 to 19999	0.053	0.056	0.058	0.060	0.061
20000 to 24999	0.067	0.070	0.073	0.076	0.078
25000+	0.082	0.086	0.090	0.093	0.095

AAVs for 1(e) low energy GU10 lamp:

Rated Lifetime (hours)	Min 48 lumens/ watt	Min 58 lumens/ watt	Min 69 lumens/ watt	Min 83 lumens/ watt	Min 100 lumens/watt
15000 to 19999	0.065	0.067	0.070	0.072	0.073
20000 to 24999	0.082	0.085	0.088	0.090	0.092
25000+	0.101	0.105	0.108	0.111	0.114

HARMONISATION WITH OTHER SCHEMES

Harmonisation is with VEET, with the exception of AAVs, which are lower, reflecting the ACT Renewable Energy Target

SKILLED INSTALLER REQUIREMENTS

ACT qualified electrician required for some lighting upgrades.

RATIONALE FOR CHANGES

The changes to existing EEIS activities are based on:

- harmonising more fully with VEET; and
- updating with new ACT emissions factors.

ISSUES TO CONSIDER

Note again that the lower AAVs required to harmonise with VEET are proposed for introduction on 1 January 2017.

6.5 ACTIVITIES TO ACHIEVE SAVINGS FROM EXISTING RESIDENTIAL APPLIANCES AND EQUIPMENT

The current activities for achieving savings from existing appliances and equipment include:

- Part 5.1 Decommissioning and disposal of refrigerator or freezer;
- Part 5.4 Install a standby power controller; and
- Part 5.6 Install a high efficiency swimming pool pump.

Extensive changes are proposed for some of these activities as outlined below.

A separate section is provided for each activity.

A new approach covering the sale of efficient new appliances is set out in Section 6.6. This replaces

- Part 5.2 Purchase of high efficiency refrigerator or freezer;
- Part 5.3 Purchase of high efficiency electric clothes dryer; and
- Part 5.5 Purchase of a high efficiency television.

Section 6.6 also covers new activities covering clothes washers and dishwashers.

PROPOSED ACTIVITY UPDATE – DECOMMISSIONING AND DISPOSAL OF REFRIGERATOR OR FREEZER

ACTIVITY DESCRIPTION

Existing activities definitions have been reviewed.

However, a range of definitions and clarifications have been included regarding the type of appliance that is eligible. In addition, the scope of the activity has been expanded to cover four main cases as follows:

- removal of an unwanted secondary pre-1996 refrigerator or freezer;
- removal of an unwanted secondary refrigerator or freezer where the age or refrigerant cannot be readily established;
- removal of a main pre-1996 refrigerator or freezer (which is be replaced with a new appliance); and
- removal of a main refrigerator or freezer (which is be replaced with a new appliance) where the age or refrigerant cannot be readily established.

These changes provide higher abatement values where the age of a unit can be established as 1996 or earlier. This reflects the higher global warming potential of pre-1996 refrigerants which give savings additional to energy saving for the proper recycling of these old units.

DRAFT AAVs BY ACTIVITY

The total abatement factor in tonnes of carbon dioxide-equivalent (t CO_2-e) of greenhouse gas emissions saved in a premises is the sum of all abatement factors for each refrigerator or freezer destroyed, determined by using the equations prescribed below.

The AAV for each refrigerator or freezer is calculated by:

- secondary refrigerator or secondary freezer with R12 (CFC) refrigerant or where the year of manufacture can be established as in or before 1996:
  Abatement Factor (t CO_2-e) = 2.1 × external volume in m^3
- secondary refrigerator or secondary freezer with unknown or other refrigerant (not R12) or where the year of manufacture cannot be established as before 1996:
  Abatement Factor (t CO_2-e) = 1.16 × external volume in m^3
- other refrigerator or other freezer with R12 (CFC) refrigerant or where the year of manufacture can be established as in or before 1996:
  Abatement Factor (t CO_2-e) = 0.88 × external volume in m^3
- other refrigerator or other freezer with unknown or other refrigerant (not R12) or where the year of manufacture cannot be established as before 1996:
  Abatement Factor (t CO_2-e) = 0.37 × external volume in m^3

The measured external dimensions for depth, width and height for each product and the calculated external volume (in m^3) of the product shall be recorded in the activity register.

Some illustrative calculations for six example product sizes showing AAVs earned are set out in the following tables.

Table 6: Sample calculations for removal of secondary refrigerator with R12 refrigerant (pre-1996)

Parameter	Ex1	Ex2	Ex3	Ex4	Ex5	Ex6
Volume external (m^3)	0.3	0.4	0.5	0.6	0.7	0.8
AAV = Volume * 2.1	0.63	0.84	1.05	1.26	1.47	1.68

Notes: Removal of secondary refrigerator assumes all energy reductions are savings. Energy intensity is in kWh per unadjusted litre of volume. External volume in m^3 is converted to litres by a factor of 1000 divided by 1.688 (m^3 × 592.4). Climate adjustment for lower use and unconditioned parts of the home. Energy deterioration of 20% applies to units over 20 years. Emission intensity for electricity assumed to be 0.04875 t/GJ for a 7 year life.

The current EEIS AAV is 0.5923 t for a single door refrigerator (equivalent to 178 litres in the above table) and 1.0603 t for a 2 door refrigerator (equivalent to 300 litres in the above table). These values are also completely consistent with the underlying VEET values.

Table 7: Sample calculations for removal of other secondary refrigerator (age or refrigerant cannot be established)

Parameter	Ex1	Ex2	Ex3	Ex4	Ex5	Ex6
Volume external (m^3)	0.3	0.4	0.5	0.6	0.7	0.8
AAV = Volume * 1.16	0.35	0.47	0.58	0.70	0.82	0.93

Notes: Removal of secondary refrigerator assumes all energy reductions are savings. Energy intensity is in kWh per unadjusted litre of volume. External volume in m^3 is converted to litres by a factor of 1000 divided by 1.688 (m^3 × 592.4). Climate adjustment for lower use and unconditioned parts of the home. Emission intensity for electricity assumed to be 0.04875 t/GJ for a 7 year life.

It is important to note that the abatement for a newer refrigerator is considerably less than a pre-1996 refrigerator (about half in round figures). This means that the current EEIS AAV requirement (without an age limit) is far too generous for newer products and not generous enough for older products.

Table 8: Sample calculations for removal of main refrigerator with R12 refrigerant (pre-1996)

Parameter	Ex1	Ex2	Ex3	Ex4	Ex5	Ex6
Volume external (m^3)	0.3	0.4	0.5	0.6	0.7	0.8
Abatement Factor (t CO_2-e) = Volume * 0.88	0.27	0.35	0.44	0.53	0.62	0.71

Notes: Removal of main refrigerator assumes difference between old and new are savings. Energy intensity is in kWh per unadjusted litre of volume. External volume in m^3 is converted to litres by a factor of 1000 divided by 1.688 ($m^3 \times 592.4$). Climate adjustment for normal use in conditioned parts of the home. Assume common climate adjustment factor for refrigerators and freezers for simplicity. Energy deterioration of 20% applies to units over 20 years. Emission intensity for electricity assumed to be 0.04875 t/GJ for a 7 year life.

Table 9: Sample calculations for removal of other main refrigerator (age or refrigerant cannot be established)

Parameter	Ex1	Ex2	Ex3	Ex4	Ex5	Ex6
Volume external (m^3)	0.3	0.4	0.5	0.6	0.7	0.8
Abatement Factor (t CO_2-e) = Volume * 0.37	0.11	0.15	0.18	0.22	0.26	0.29

Notes: Removal of main refrigerator assumes difference between old and new are savings. Energy intensity is in kWh per unadjusted litre of volume. External volume in m^3 is converted to litres by a factor of 1000 divided by 1.688 ($m^3 \times 592.4$). Climate adjustment for normal use in conditioned parts of the home. Assume common climate adjustment factor for refrigerators and freezers for simplicity. Emission intensity for electricity assumed to be 0.04875 t/GJ for a 7 year life.

HARMONISATION WITH OTHER SCHEMES

This revised specification closely aligns with new REES requirements. The component that applies to pre-1996 secondary refrigerators still broadly aligns with VEET requirements.

SKILLED INSTALLER REQUIREMENTS

The old appliance must be destroyed in accordance with the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (Commonwealth).

RATIONALE FOR CHANGES

A significant new element of the activity is adjusting the AAV on the basis of the size of the appliance. This improves accuracy of calculations.It results in reduced abatement earned by the removal of smaller appliances and increased abatement earned by the removal of larger appliances.

ISSUES TO CONSIDER

There is good evidence that refrigerator energy consumption tends to deteriorate after about 20 years, so an additional factor has been applied to old appliances (i.e. those manufactured before 1996).

PROPOSED ACTIVITY UPDATE – STANDBY POWER CONTROLLERS

ACTIVITY DESCRIPTION

The activity definition remains largely unchanged as part of this review. Default abatement values are unchanged.

The main changes in this revision are:

- products that rely on field trials can earn different abatement values. These must be listed on the VEET Products Register and the VEET Abatement Values are multiplied by 0.16.
- a maximum of four SPCs be installed in any one premises.

DRAFT AAVs BY ACTIVITY

The abatement factor for each activity item is—

SPC for an information technology and audio visual environment: 0.16 t CO_2-e

Abatement factors for standby power controllers that rely on field trials to establish energy savings and abatement:

Abatement Factor (tCO_2-e) for each standby controller = (VEET-AF) × 0.16

Abatement Factor (t CO_2-e) premises = $\sum_{i=1}^{n} Abatement - factor_i$

Where—

a. VEET-AF is the Abatement Factor recorded in the VEET Product Register for the model and brand of standby power controller installed in accordance with the specifications
b. 0.16 is a factor that converts Abatement in Victoria to Abatement in the ACT
c. For each standby controller *i* the abatement factor installed in each premises is calculated and then summed to give the total abatement factor.
d. n is the number of standby controllers installed in the premises, which is in the range 1 to 4 (maximum).

HARMONISATION WITH OTHER SCHEMES

This activity definition is aligned with VEET Schedule 29. REES in South Australia also have this activity, but with adjusted values.

SKILLED INSTALLER REQUIREMENTS

Nil

PROPOSED ACTIVITY UPDATE – INSTALL A HIGH EFFICIENCY SWIMMING POOL PUMP

ACTIVITY DESCRIPTION

The activity definition remains largely unchanged as part of this review.

A clarification is proposed so that the qualifying requirement is 3 stars (to align with VEET and REES).

It is proposed that from 2017, pool pump controllers shall comply with AS/NZS 4755.3.2 *Demand response capabilities and supporting technologies for electrical products.*

DRAFT AAVS BY ACTIVITY

Abatement factor (t CO_2-e) = (1622 – PAEC) × 0.001228

Where PAEC is the projected annual energy consumption in kWh/y listed on the energy rating label.

HARMONISATION WITH OTHER SCHEMES

This activity definition is aligned with VEET Schedule 26.

SKILLED INSTALLER REQUIREMENTS

Pumps should be installed by appropriately qualified technicians

Demand response equipment will need to be in accordance with local electricity distribution requirements.

RATIONALE FOR CHANGES

No significant changes to the AAVs earned have been made in this review.

6.6 SALE OF NEW RESIDENTIAL APPLIANCES

A new approach to the sale of efficient appliances is proposed for EEIS as part of this review. This will replace the existing activities listed below and will cover two new appliances as follows:

- Part 5.2 Purchase of high efficiency refrigerator or freezer;
- Part 5.3 Purchase of high efficiency electric clothes dryer;
- Part 5.5 Purchase of a high efficiency television;
- New activity – Sell a high efficiency clothes washers; and
- New activity – Sell a high efficiency dishwasher.

PROPOSED NEW ACTIVITY – SELL A HIGH EFFICIENCY APPLIANCE

As discussed in Section 5, this is a proposed new activity. The key change is that retailers can earn AAV credits if their sales-weighted fleet average of all appliance sales is above the average market efficiency. This activity would no longer require participation of purchasers in order to earn credits.

Retailers would have to submit all sales records of each appliance type for which they wish to earn credits (sales numbers and brand/model). Where the sales-weighted average efficiency is significantly above the market average, the retailer would earn credits for all appliances sold.

DRAFT AAVs BY ACTIVITY

Conceptually, the approach to be used for each appliance would be the same as the one currently used for existing appliances in terms of calculating the credits earned. Currently, the baseline is set to be the market average (typically a star rating level at some time in the past) and credits are earned where the energy consumption of the product is lower than the specified baseline. The aim of this new system is to reward retailers that sell a disproportionate share of high efficiency appliances with minimal transaction costs. Because the market is continually changing, it will be necessary to set a dynamic baseline that is updated each year.

The proposed baselines for each of the appliances covered are set out below.

REFRIGERATORS

The current market average and the proposed baselines by Group are given in the following table (all as per 2010 labelling algorithm):

Table 10: AAV factors for refrigerators and freezers (2010 algorithm)

Group	Fixed allowance factor (Cf) kWh/ year	Variable allowance factor (Cv) kWh/year/L	Energy Reduction Factor (ERF)	Market 2014 SRI	Proposed Baseline SRI (stars)	AAV Factor	Comment
1	200	4.0	0.23	1.80	1.80	0.00190	
2	200	4.0	0.23	1.63	1.80	0.00190	Previously excluded
3	200	4.0	0.23	1.29	1.80	0.00190	Previously excluded
4	150	8.8	0.23	1.86	2.60	0.00190	Few sales
5T	150	8.8	0.23	2.72	2.60	0.00190	Common base
5B	150	8.8	0.23	2.59	2.60	0.00190	Common base
5S	150	8.8	0.23	2.16	2.60	0.00190	Common base
6C	150	7.5	0.23	2.76	2.75	0.00211	
6U	150	7.5	0.23	2.28	2.30	0.00211	Common base
7	150	7.5	0.23	2.19	2.30	0.00211	Common base

Notes: SRI is star rating index (fractional star rating).

Generic refrigerator and freezer AAV is given as follows:

Abatement factor (t CO_2-e) = $\{(0.77)^{(SRI-1)} \times [Cf + Cv \times (V_{adj})^{0.67}] - CEC\} \times$ AAV Factor

Where—
SRI is the baseline star rating (SRI) for the appliance in a given year as given in Table 10.

0.77 is (1 – ERF)

V_{adj} is the adjusted volume for the model as recorded on Energy Rating

CEC is the energy for the model as recorded on Energy Rating in kWh/year

Cf, Cv and AAV Factor are as shown in Table 10 for the appliance Group.

AAV Factor includes adjustments for user interactions and indoor temperatures during normal use as well as lifetime and emission intensity.

Abatement is summed for all appliance sales of the appliance type and the net abatement is calculated for a retailer.

Worked example:

Group 5T refrigerator, Fresh food 313 litres, Freezer 103 litres, V_{adj} 477.8, CEC=318, SRI=4.01

Abatement factor (t CO_2-e) = $\{(0.77)^{(2.6-1)} \times [150 + 8.8 \times (477.8)^{0.67}] - 318\} \times 0.00190$

= 0.27 t CO_2-e

DRYERS

The current market average star rating (baseline) is estimated to be 2.10 stars

Generic dryer AAV is given as follows:

Abatement factor (t CO_2-e) = $((0.85)^{(SRI-1)} \times 51 \times$ Rated Capacity – CEC) × AAV Factor

Where—
SRI is the baseline star rating for the appliance in a given year.

AAV Factor = 0.00260 and takes into account lifetime and emissions intensity.

CEC is the energy for the model as recorded on Energy Rating in kWh/year

Rated Capacity is as recorded on Energy Rating in kg

Abatement is summed for all appliance sales of the appliance type and the net abatement is calculated for a retailer.

Worked example:

Heat pump dryer CEC: 123, SRI = 8.6, rated capacity = 8kg

Abatement factor (t CO_2-e) = $((0.85)^{(2.1-1)} \times 51 \times 8 - 123) \times 0.00260$ = 0.567 t CO_2-e

TELEVISIONS

The current market average star rating (baseline) is estimated to be 5.50 stars (2013 algorithm)

Generic television AAV is given as follows:

Abatement factor (t CO_2-e) = $\{(0.80)^{(SRI-1)} \times [65.408 + 0.09344 \times$ Screen-area] – CEC} × AAV Factor

Where—
SRI is the baseline star rating for the appliance in a given year.

CEC is the energy for the model as recorded on Energy Rating in kWh/year

Screen-area is the screen area for the model as recorded on Energy Rating in cm^2

AAV Factor = 0.000842 and takes into account lifetime and emissions intensity and usage.

Abatement is summed for all appliance sales of the appliance type and the net abatement is calculated for a retailer.

Worked example:

CEC = 53 kWh/year, 2088 cm^2 (nominal 70cm), 8.1 stars

Abatement factor (t CO_2-e) = $\{(0.80)^{(5.5-1)} \times [65.408 + 0.09344 \times 2088] - 53\} \times 0.000842$ = 0.036 t CO_2-e

CLOTHES WASHERS

The current market average star rating (baseline) is estimated to be 3.0 stars

Generic clothes washer AAV is given as follows:

Abatement factor (t CO_2-e) = $((0.73)^{(SRI-1)}$ × 109 × Rated Capacity – CEC) × AAV Factor

Where SRI is the baseline star rating for the appliance in a given year.

AAV Factor = 0.000832 and includes adjustments for lifetime, emissions intensity, usage, mix of wash temperatures, loading and cold water temperatures in Canberra.

Note that the BEC for clothes washers is given as 115 times rated capacity. This figure has been replaced by 109 to take into account the market average changes in spin performance with star rating.

Abatement is summed for all appliance sales of the appliance type and the net abatement is calculated for a retailer.

Worked example:

7kg washer, 4.55 stars, CEC = 200 kWh/year

Abatement factor (t CO_2-e) = $((0.73)^{(3.0-1)}$ × 109 × 7 – 200) × 0.000832

= 0.172 t CO_2-e

DISHWASHERS

The current market average star rating (baseline) is estimated to be 3.50 stars

Generic dishwasher AAV is given as follows:

Abatement factor (t CO_2-e) = $((0.7)^{(SRI-1)}$ × 48 × Place Settings – CEC) × AAV Factor

Where SRI is the baseline star rating for the appliance in a given year.

AAV Factor = 0.000953 and includes adjustments for lifetime, emission intensity, usage and cold water temperatures in Canberra.

Abatement is summed for all appliance sales of the appliance type and the net abatement is calculated for a retailer.

Worked example:

15 place setting, 4.53 stars, CEC 205kWh/year

Abatement factor (t CO_2-e) = $((0.7)^{(3.5-1)}$ × 48 × 15 – 205) × 0.000953

= 0.086 t CO_2-e

HARMONISATION WITH OTHER SCHEMES

This new activity is broadly based on other scheme approaches for efficient new appliances in terms of the approach to define average and high efficiency but differs in that it uses a dynamic baseline and assesses all sales made by participating retailers in order to judge whether their sales fleet average is above the market average.

SKILLED INSTALLER REQUIREMENTS

Nil

RATIONALE FOR THE ACTIVITY – SELL A HIGH EFFICIENCY NEW APPLIANCE

As detailed in section 5.

ISSUES TO CONSIDER – SELL A HIGH EFFICIENCY NEW APPLIANCE

- An additional option is to allow market average baselines to be anchored for each individual retailer in the year they commence a program. This means that if a retailer undertakes an initiative that increases efficiency of the market, they are rewarded for it in future years. This anchoring would need to take into account adjustments for business as usual efficiency gains.
- Should Group 2 and Group 3 products be excluded from the AAVs for refrigerators (currently included, but were not permitted in Part 5.2)?
- There is a case for capping the size or energy consumption of eligible televisions that can qualify for AAVs. Capping of credits by size is effectively undertaken by comparable state schemes.
- Because this activity is based on sales of appliances, it would have to be limited to retailers that are located in the ACT and that sell predominately into the ACT market. What evidence can practically be provided on the sales or proportion of sales to consumers in the ACT?

7. PROPOSED NEW ACTIVITIES

7.1 STANDALONE EEIS COMMERCIAL LIGHTING METHOD

ACTIVITY DESCRIPTION

This new activity would be an EEIS standalone commercial lighting method, similar to those in the VEET, ESS and REES Schemes. The proposed approach taken is most closely based on the REES method and would have three main components:

- use the NSW ESS Commercial lighting formula to calculate lifetime electricity savings;
- use NSW ESS product register (which is harmonised with the VEET register); and
- specify harmonised standards and evidentiary requirements for installation and product safety and quality.

This method would be implemented within the existing EEIS administrative framework, which requires retailers who must submit compliance plans and reports in line with method requirements. Under this approach high efficiency commercial lighting service providers would need to contract to an energy retailer.

The activity involves upgrade of commercial lighting equipment at eligible ACT business premises (not new build or refurbishments requiring planning consent). Recipients who are large energy consuming customers (>160MWh pa) shall be required to contribute a part-payment.

Lamps and luminaires installed shall be listed on the public list of accepted Emerging Lighting Technologies (ELTs) as published by the NSW Energy Savings Scheme (ESS) Administrator (effectively LEDs). All equipment installed shall be supplied with a minimum two years product warranty. T5 adaptor kits and LED linear "tube-only" replacement lamps are not included (note that LED linear "tube-only" replacements are allowed in REES). The rationale for excluding these from the EEIS is that integrated LED luminaires are a superior choice (i.e. permanent) and are similarly excluded from the NSW ESS.

CALCULATION OF ABATEMENT FACTOR

The proposed formula for calculating abatement from this activity is:

The total abatement factor in tonnes of carbon dioxide-equivalent (tCO_2-e) of greenhouse gas emissions saved for the activity is calculated as —

Abatement Factor (tCO_2-e) = Lifetime MWh Energy Savings x 0.153

Where—
Lifetime MWh Energy Savings is calculated in accordance with Clause 9.4 of the NSW ESS Rule
0.153 is the conversion of MWh to tCO2-e using an assumed average deeming period of 10 years

HARMONISATION WITH OTHER SCHEMES

Harmonisation is with the NSW ESS.

SKILLED INSTALLER REQUIREMENTS

ACT licensed electrician

RATIONALE FOR CHANGES

N/A - new activity

ISSUES TO CONSIDER

- **Warranty requirements** – The REES Scheme requires 2 year warranties on installed products, in addition to requiring the equipment to be on the ESS product register. The safety and quality of products and installations are of paramount importance to the Territory. We are seeking stakeholders' feedback on adopting a similar two year warranty provision for the proposed EEIS Standalone commercial lighting method.
- **Residual Current Devices (RCDs)** – are electrical safety devices designed to immediately switch off the supply of electricity when electricity leaking to earth is detected at harmful levels. They offer high levels of personal protection from electric shock. To ensure consumer safety the Territory is considering a requirement to require the installation of Residual Current Devices (RCDs) in all commercial lighting upgrades, where this equipment is not already in place.

7.2 ESS INTEGRATED COMMERCIAL LIGHTING METHOD

ACTIVITY DESCRIPTION

A commercial lighting upgrade activity, being the transfer of Energy Savings Certificates to the Territory, where those Energy Savings Certificates have been created under the NSW Energy Savings Scheme for commercial lighting upgrades in the Australian Capital Territory.

CALCULATION OF ABATEMENT FACTOR

1. The total abatement factor in tonnes of carbon dioxide-equivalent (tCO_2-e) of greenhouse gas emissions saved for the activity is calculated as —

   Abatement factor (tCO_2-e) = AAV x N

   Where—
   AAV is the relevant activity abatement value, and is equal to 0.144 tCO_2-e; and
   N is the number of Energy Savings Certificates transferred.

HARMONISATION WITH OTHER SCHEMES

Complete harmonisation is with ESS, with the exception of:

- ACT specific AAVs;
- activities must be implemented in eligible premises in the ACT; and
- third party provider must also be on an approved ACT provider register.

SKILLED INSTALLER REQUIREMENTS

Code of practice to clarify that electricians must hold ACT licences

RATIONALE FOR CHANGES

Stakeholder consultation has suggested that the fixed administrative costs of establishing ACT only projects are prohibitively high for many Tier 2 retailers and third party providers.

Integration with the ESS in this way provides significant administrative simplicity and efficiency while driving increased investment in new energy saving projects, by allowing:

- providers to lower abatement costs by leveraging existing accreditations, business and compliance processes and resources and to spread audit costs across NSW and ACT projects;
- retailers to fund additional energy savings projects in the ACT, while keeping compliance and abatement costs down; and
- the Territory to expand participation of Tier 2 retailers and third party providers to complex activities, while leveraging existing NSW administrative, assurance and compliance systems to keep scheme costs down.

ISSUES TO CONSIDER

- To be able to protect EEIS integrity and ACT consumers, the Territory wishes to retain the ability to suspend or disqualify providers from participation. In accordance with the EEIS legislation the Territory will establish a register of approved providers. It is envisaged that initial approval will require:
  - accreditation by NSW IPART to conduct Commercial Lighting projects in the ACT; and
  - completion of EEIS training by providers and installers .
- Suspension or removal from the approved register would occur in the event of poor practices under this process. Administrative processes would be developed to render ACT ESCs invalid for projects implemented while a provider was suspended or removed from the ACT provider register.
- The Territory seeks stakeholder perspectives on how to best meet these objectives.

7.3 ESS INTEGRATED PIAM&V METHOD

ACTIVITY DESCRIPTION

A project impact assessment with measurement and verification activity, being the transfer of Energy Savings Certificates to the Territory, where those Energy Savings Certificates have been created under the NSW Energy Savings Scheme using the project impact assessment with measurement verification method for a site in the Australian Capital Territory.

CALCULATION OF ABATEMENT FACTOR

The total abatement factor in tonnes of carbon dioxide-equivalent (tCO_2-e) of greenhouse gas emissions saved for the activity is calculated as —

Abatement factor (tCO_2-e) = AAV x N.

Where—

AAV is the relevant activity abatement value, and is equal to 0.194 tCO_2-e; and

N is the number of Energy Savings Certificates transferred.

HARMONISATION WITH OTHER SCHEMES

Complete harmonisation is with ESS, with the exception of:

- ACT specific AAVs;
- activities must be implemented in eligible premises in the ACT; and
- third party provider must also be on an approved ACT provider register.

SKILLED INSTALLER REQUIREMENTS

Code of practice to clarify that where electricians or plumbers are required, they must hold ACT licences

RATIONALE FOR CHANGES

Stakeholder consultation has suggested that the fixed administrative costs of establishing ACT only projects are prohibitively high for many Tier 2 retailers and third party providers.

ISSUES TO CONSIDER

- The proposed approach to convert ACT ESC to abatement assumes emissions intensity based on the default PIAM&V value of 10 years. The approach of assuming an average lifetime is broadly consistent with that taken for the integrated commercial lighting method and for all other activity specific (DAF) EEIS methods.
- In practice, some PIAM&V projects may use deeming periods drawn from the ESS persistence model. If this occurs, savings lifetime could be greater than or less than 10 years for different projects.
- An alternative approach would be to require retailers to identify the deemed lifetime for each unique project, behind every ACT ESC and apply the appropriate different emissions intensity factors. This would add considerable complexity for retailers and administrative complexity for the Territory to verify calculations.
- In consideration of the average lifetime for typical PIAM&V projects, is the proposed simplified single emissions intensity factor approach appropriate? What alternative approaches should be considered and why?