ESSENTIAL SERVICES COMMISSION

Victorian Energy Upgrades forum

Jeff Cefai, Director
Essential Services Commission

29 June 2018

Victorian Energy Upgrades

Victorian Energy Upgrades forum - 29 June 2018

Agenda – Victorian Energy Upgrades forum – 29 June 2018			
9:30	MC introduction (Jeff Cefai, Director) (5min)		
9:35	Welcome and opening comment (John Hamill, CEO) (5mins)		
9:40	Victorian Energy Upgrades program update (Jeff Cefai, Director) (15mins)		
9:55	Update from the Department of Environment, Land, Water and Planning (DELWP) (15mins)		
10:10	Q&A (5min)		
10:15	Morning tea (15mins)		
	Workshops		
	Stream A: Theatrette	**Stream B: Boardroom A**	**Stream C: Boardroom B**
10:30	A1: 2018 Principal Regulations (1.5h)	B1: Accreditation and VEEC assessments (Registry) (1h)	C1: PBA M&V and benchmark rating (part 1) (2h)
	A2: VEET website upgrade (30min)	B2: Audit and compliance (A&C) (1h)	
12:30	Lunch (30mins)		
13:00	A3: Product applications (1h)	B3: 1-1 sessions with APs (Registry, A&C) (1h)	C2: PBA M&V and benchmark rating (part 2) (1h)
14:00	CLOSE		

Sli.do

How to:

1. Either open the web browser and go to www.sli.do or download the sli.do app.
2. Enter the event code # **X991** to join the event '**VICTORIAN ENERGY UPGRADES FORUM**'.
3. Select the session you are attending.
4. You will now be able to type in and submit your questions. To prioritise your own or other people's questions, click the 'like' button that appears next to each question. Questions are sorted by their popularity, so the most popular ones appear on top.

ESSENTIAL SERVICES COMMISSION

Victorian Energy Upgrades forum

John Hamill, CEO

Essential Services Commission

ESSENTIAL SERVICES COMMISSION

VEU scheme updates

Jeff Cefai, Director

Essential Services Commission

Tenth anniversary of the VEU scheme

Over 10 years, the scheme has:

- created VEECs to meet annual targets for each of the 10 years (55.7 million)
- supported the installation of more than 29 million high efficiency lamps.

In 2018, savings from activities undertaken over the past 10 years are estimated to save Victorian households and businesses more than $500million.

Scheme performance since 2009

VEU scheme update (Oct 2017- June 2018)

- **More than 52,000 installations undertaken**
  - Residential: 39,000
  - Non-residential: 13,000
  - Regional: 18,000
  - Metro: 34,000

- **VEEC creation**
  - The 2018 VEEC target (6.1 million) was met in February 2018 – record early target achievement
  - 5.3 million VEECs created (Oct 2017-June 2018)
  - 5.0 million VEECs registered (Oct 2017-June 2018)

Key VEU scheme administrative changes and updates in 2018

- Release of updated VEET guidelines
- Implementation of discount factor (2 stages)
- Released policy on claiming emerging products under schedule 34
- Released position on claiming for replacement of inoperable products
- Changes to our MST requirements
- Published Register of BCA determinations
- Review of our IT systems

Engagement with stakeholders

- **Public consultations:**
  - Proposed amendments to the VEET Guidelines 2018 (April 2018)
  - Proposed changes to mandatory safety training requirements (January 2018)
- **Public surveys:**
  - Stakeholder survey on the VEEC registration process
  - ESC reputational survey
- **Meetings and other consultation with stakeholders**

Audits and stakeholder contacts (Oct 2017-June 2018)

Project-based activity

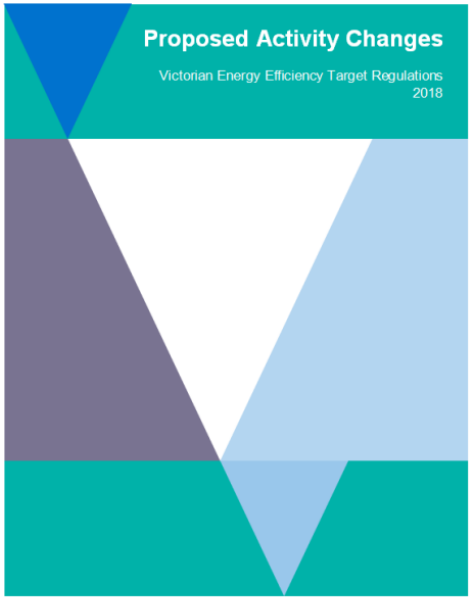
- **Average assessment times (with the ESC)**
  - Scoping plans: 0.7 days
  - Project plans: 2.1 days
  - Impact report: 7.4 days
- **High levels of stakeholder interest**
- **Good variety of project types**
- **Workshops with all PBA APs and AM&VPs**
- **Further engagement with stakeholders**
- **New methods – benchmark rating**

Product approvals

- **Approved products since October 2017- June 2018**
  - Total submitted products: 1,093
  - Total approved products: 1,041 (122 per month)
- **Approved products since 2017/2018 financial year**
  - Total submitted products: 1,688
  - Total approved products: 1,594 (138 per month)
- **Updated *Explanatory note – lodging a product application* published on the VEET website**

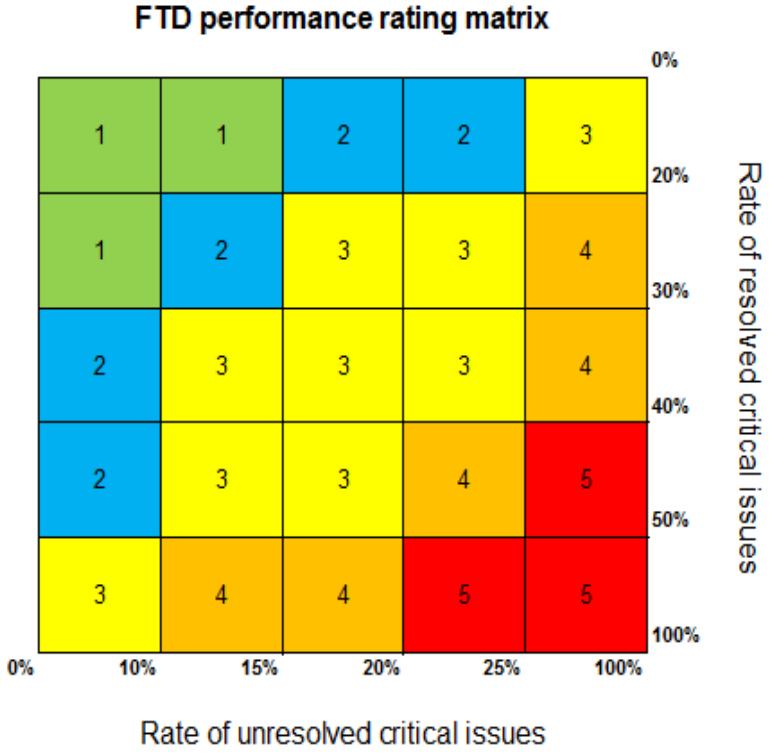
New VEET regulations in 2018

- **Development of administrative framework for 2018 regulations**
  - New website content
  - New stakeholder documents
  - Updated administrative requirements
  - Updated IT specifications



Scheme news

Target days



Performance rating	1	2	3	4	5
Target days	7 days	14 days	21 days	28 days	42 days

Victorian Energy Upgrades

The Department of Environment, Land, Water and Planning develops policy for the Victorian Energy Upgrades program.

We administer the program as the 'Victorian Energy Efficiency Target scheme' under the *Victorian Energy Efficiency Target Act 2007*.

For more information, visit **veet.vic.gov.au**.

Contact us

ESSENTIAL SERVICES COMMISSION	www.esc.vic.gov.au www.veet.vic.gov.au
	/company/essential-services-commission
	@EssentialVic

29 June 2018

Victorian Energy Upgrades Policy Update – DELWP

Victorian Energy Upgrades

VICTORIA State Government

Introduction to the department

- Victorian Government
  - committed to help drive energy efficiency
  - initiatives include Victorian Energy Upgrades, Boosting Business Productivity, and the Victorian Residential Efficiency Scorecard
- The Department of Environment, Land, Water and Planning works to develop a secure and sustainable energy future
  - Victorian Energy Upgrades team manages changes to the Victorian Energy Efficiency Target (VEET) legislation and regulations
- Sustainability Victoria facilitates and promotes environmental sustainability in the use of resources, including delivering some energy efficiency programs for businesses and households

Boosting Business Productivity

- $6.1 million program to support businesses
- Program includes:
  - Gas efficiency grants
  - Energy assessment grants
  - Materials efficiency grants
  - Free sustainable finance service
  - Case studies and tips for energy efficienc

Sustainability Victoria

- To learn more about the program, please visit:
  http://www.sustainability.vic.gov.au/Business

10 years of the program

- The Victorian Energy Efficiency Target Regulations 2008 were made on 1 January 2009
- Since that time, the scheme has:
  - created sufficient certificates to meet our targets for 10 years
  - helped more than 1.8 million households and 80,000 businesses save money on their energy bills
  - supported the installation of more than 29 million high efficiency lamps
- In 2018, the cumulative savings from the upgrades installed over the past 10 years will reduce Victorian energy bills by more than $500 million.
- The achievements of the program have been delivered by accredited persons and all the other stakeholders who engage with the scheme

Regulation remaking

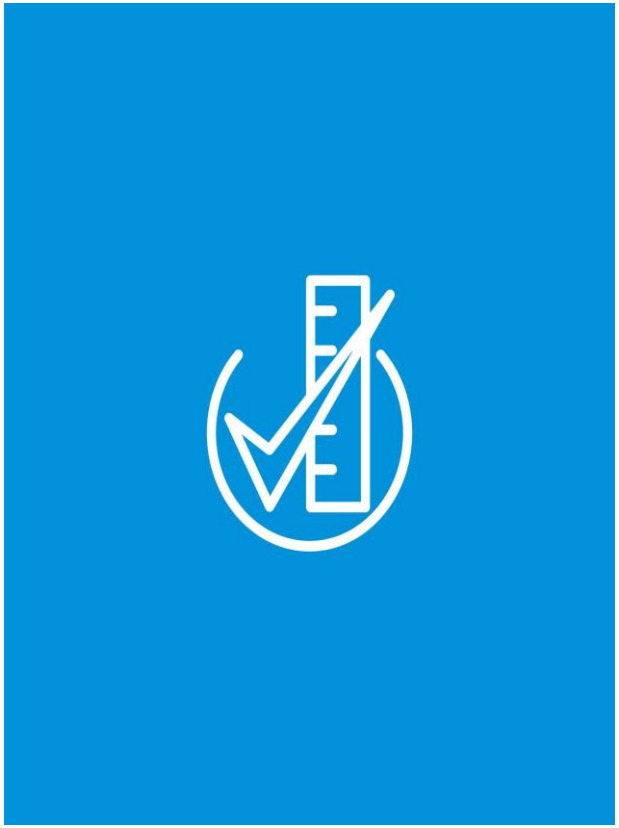
- *The Victorian Energy Efficiency Target Regulations 2008* sun-set in December 2018 and need to remade
- A Regulatory Impact Statement (RIS) accompanies the release of the proposed Regulations and sets out the justification for remaking them
- The Regulations have been reviewed and changes proposed:
  - splitting into Regulations and Specifications – Guidelines document on how the Specifications will be updated
  - fresh start for all activities – these are new Regulations
  - reduced red tape by removing the requirement for duplicate registration
  - greater support for innovation by allowing flexibility to include new technologies and products in the program
  - transitional arrangements

Consultation and stakeholder feedback

- Consultation feedback via the Engage Victoria website – www.engage.vic.gov.au/review-victorian-energy-efficiency-target-regulations **- NOW CLOSED**
- Information session held on 24 May
- We had around 40 submissions – survey and written
- We are reviewing and analysing all comments and may adjust the Regulations or Specifications
- Updates will continue to be given using the Engage Victoria website
- Response to consultation released in the third quarter of 2018
- Regulations remade in October and commence in December 2018

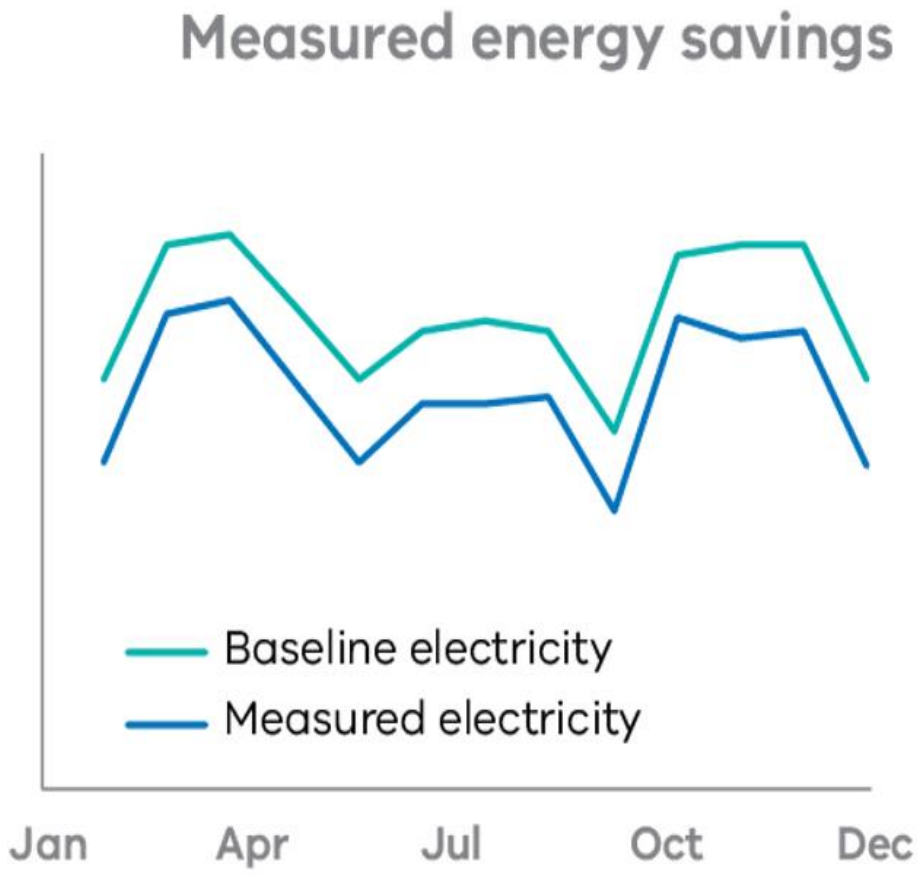
Measurement and Verification method

- Measurement and Verification (M&V) introduced in June 2017
- First certificates created in June 2018
- Grants for early participants in the M&V method – up to $25,000 for metering, baseline data collection and development of a business case
  - Grants application period extended, see: https://www.energy.vic.gov.au/energy-efficiency/victorian-energy-upgrades/project-based-activities



Training resources

- Manual provides guidance on key concepts in applying the M&V method
  - worked examples
  - similarities to NSW ESS and IPMVP
  - best practice
- M&V workbook in Excel



What else is going on?

- Benchmark rating method – based on comparison of before and after NABERS ratings – to be launched soon
- Improving communications and engagement – stakeholder survey completed, thank you for your participation
- New activities prioritisation workshops – discussion paper to released in the near future

Thanks!

Subscribe to our program updates (on all activities) on our website:

https://www.energy.vic.gov.au/energy-efficiency/victorian-energy-upgrades

Questions and comments?

ESSENTIAL SERVICES COMMISSION

2018 Regulations project

Stream A

29 June 2018

Victorian Energy Upgrades

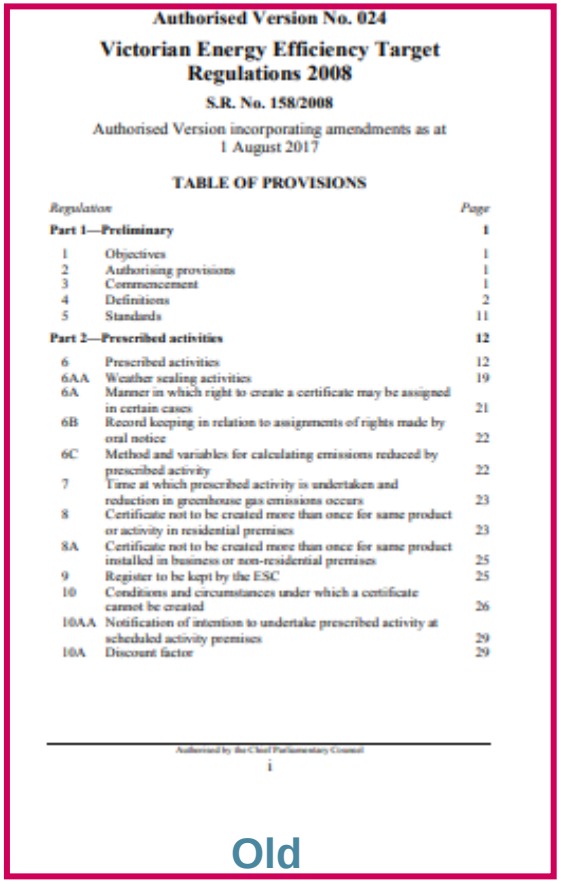
Overview

- **What** is the scope of changes?
- **When** will changes be introduced?
- **How** are we managing the changes?
- **What** proposed administrative changes are being made?
- **Feedback** from you

Note: Follow up policy matters with DELWP

Scope of changes

New regulations consist of two documents - 2018 Principal Regulations and 2018 Specifications



Authorised Version No. 024

Victorian Energy Efficiency Target Regulations 2008

S.R. No. 158/2008

Authorised Version incorporating amendments as at 1 August 2017

TABLE OF PROVISIONS

Authorised by the Chief Parliamentary Counsel

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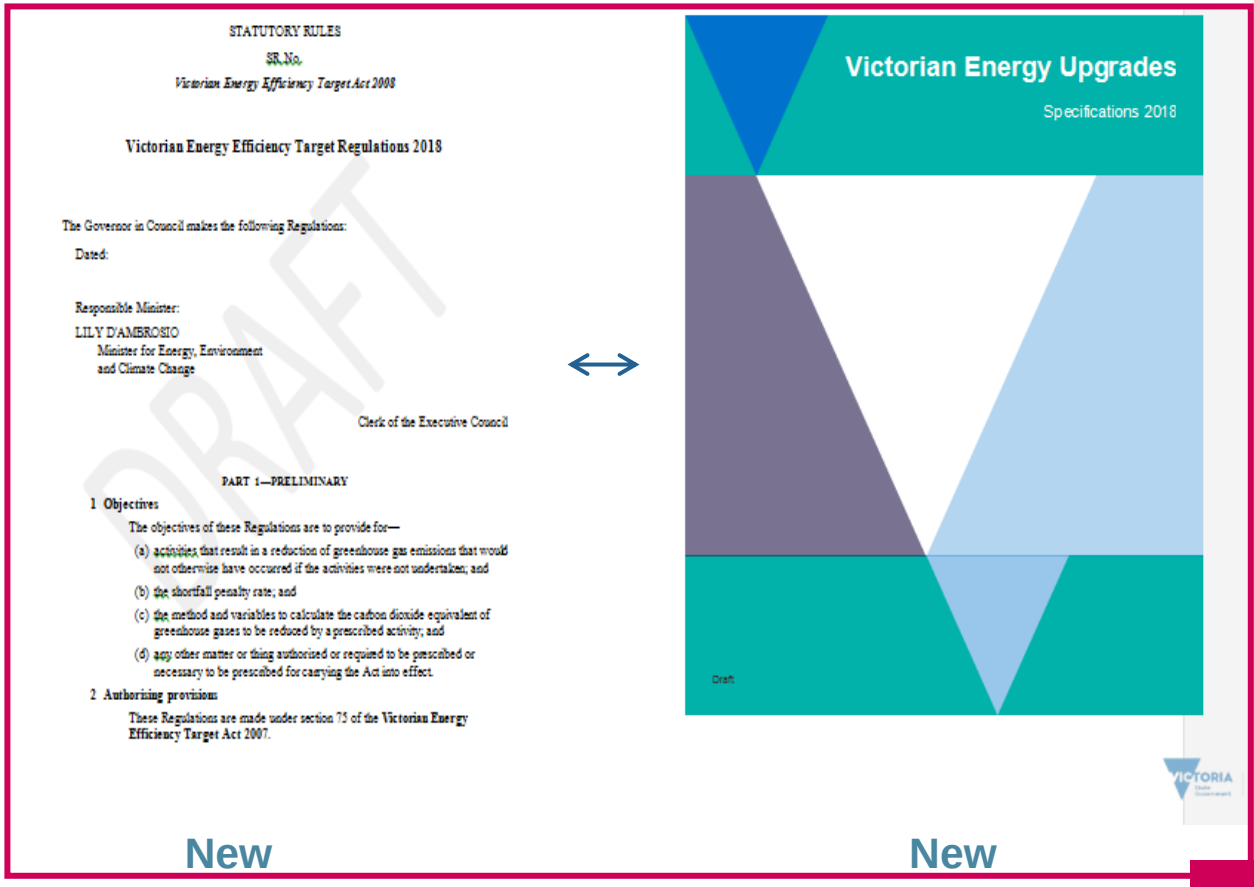
Old



STATUTORY RULES

SR No.

Victorian Energy Efficiency Target Act 2008

Victorian Energy Efficiency Target Regulations 2018

The Governor in Council makes the following Regulations:

Dated:

Responsible Minister:

LILY D'AMBROSIO
Minister for Energy, Environment and Climate Change

Clerk of the Executive Council

PART 1—PRELIMINARY

1 Objectives

The objectives of these Regulations are to provide for—

(a) activities that result in a reduction of greenhouse gas emissions that would not otherwise have occurred if the activities were not undertaken; and

(b) the shortfall penalty rate; and

(c) the method and variables to calculate the carbon dioxide equivalent of greenhouse gases to be reduced by a prescribed activity; and

(d) any other matter or thing authorised or required to be prescribed or necessary to be prescribed for carrying the Act into effect.

2 Authorising provision

These Regulations are made under section 75 of the Victorian Energy Efficiency Target Act 2007.

DRAFT

New

New

What's in…what's out

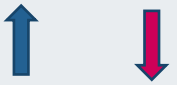
Out ☒☒☒	In ☑☑☑
Schedules	Parts
2B – solar retrofit kit	37-41 - gas efficiency methods
4B - water heating - solar pre-heater	Fan motors in air handling systems under Activity 33
19 - destruction of pre-1996 refrigerator	
29 - standby power controller	
35 - low flow trigger nozzle	
Gas clothes dryer under Activity 25	

Scope of **proposed** changes

Key proposed changes include:

- Revised GHG equations for all 40+ activities (aside from activity 21 – lighting)
- Fresh start for all activities
- Changes to product requirements
- Changes to installation requirements
- Updates to standards
- New terminology/updated definitions
- Removal of ESC register requirements for MEPS/AEMO listed products
- Transitional arrangements

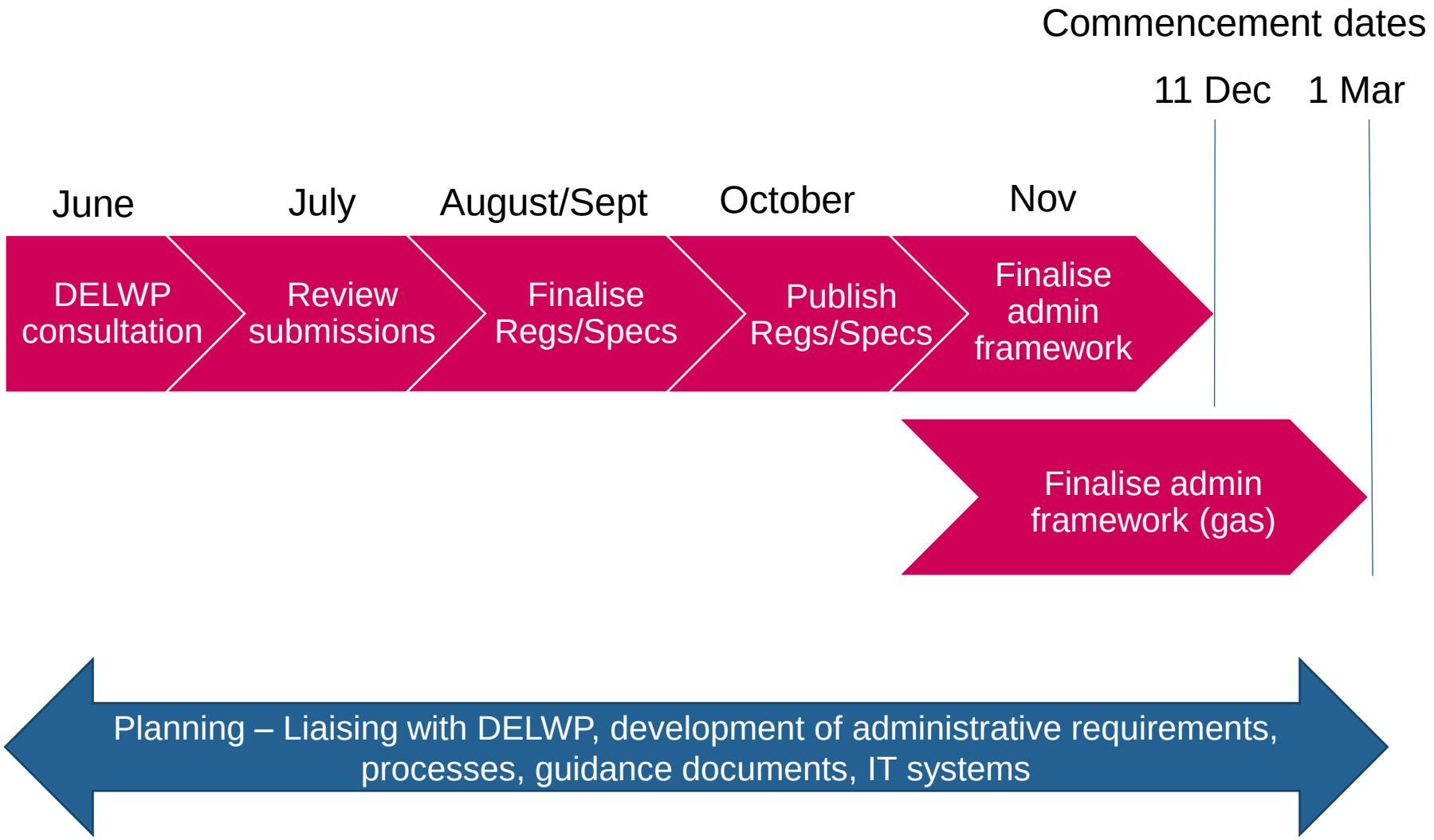
Current vs proposed VEECs – in general

Activity no.	Activity	Changes in VEECs
1 to 4	Water heating	
5 to 10, 23 and 28	Space heating and cooling	
12, 13, 14, 15, 24, 30, 31, 32, 33	Insulation, windows, weather sealing, tv, in home displays, motors, refrigerated display cabinets, fan motor upgrades,	
17, 22, 25, 26	Low flow shower roses, refrigerators and freezers, clothes dryers, pool pumps	
21	Lighting (part 21)	No change
34	Building based lighting upgrade	
27 and 35	Non-building based lighting upgrade and public lighting	

Current vs proposed VEECs – specific examples

Current Schedule	Proposed scenario	Activity	Current VEECs	Proposed VEECs
1E	1D	Installation of medium heat pump water heater with a Bs of 6.113 GJ/year and a Be of 0.056 GJ/year in Regional Victoria	44	29 
9	9A(i)	Decommissioning a fixed electric room heater and installing a high efficiency gas room heater in Regional Victoria (cold) that is 6 stars and has a thermal output (or capacity) of 6 kW	5	60 
17	17A	Installation of 2 low flow shower roses in regional Victoria Installation of 1 low flow shower rose in Metropolitan Victoria	6 2	2 1 
25	25A	Installation of an 8kg electrical clothes dryer with a CEC of 123 (kWh/yr) in Regional Victoria Installation of a 7kg electrical clothes dryer with a CEC of 143 (kWh/yr) in Metropolitan Victoria	5 3	1 1 
34	34	A non-J6 upgrade, involving the replacement of 100 T8 linear (nominal lamp power of 35 watts) fluorescent lamps (magnetic ballasts in which no EEI is marked) with 100 LED linear lamps (lamp circuit power of 12 watts), including modification of the luminaires, into an air conditioned office located in metropolitan Victoria (no lighting control devices)	89	56 
34	34	Non-J6 upgrade, involving removal of 100 T8 linear fluorescent lamps (ballasts with an EEI of A1, NLP of 35 watts) including the luminaires and replacing with 50 LED integrated luminaires (total circuit power of 20 watts), into an a/c office in metro Victoria (no LCDs present)	73	91 
34	35	A non-building based upgrade, involving replacement of 20 mercury vapour lamps with magnetic ballast (NLP of 400 watts) with 20 LED luminaires (total circuit power of 135 watts), into a public park in regional Victoria. Occupancy sensors installed at time of upgrade, each controlling 5 luminaires (no LCDs installed before the upgrade)	318	318 

Key timelines



What are we doing to prepare?

- Working closely with DELWP
- Established topic based working groups – highest priority to ‘active’ activities (lighting, space heating, water heating, low flow shower roses, IHDs)
- Looking to improve our guidance documents and forms
- Looking to improve our website content
- Looking to improve our IT registry system
- Consulting with subject matter-experts
- Consulting with industry and key stakeholders
- Monitoring key risks

Transitioning from 2008 to 2018 Principal Regulations

All stakeholders should:

- understand changes to product requirements, activity requirements, compliance requirements, VEEC values etc.
- understand how changes may impact your business and plan accordingly
- understand risks to your business
- be aware of transitional arrangements

Transitioning from 2008 to 2018 Principal Regulations

We plan to assist stakeholders by:

- providing guidance documents to assist with understanding the changes
- aiming to communicate changes prior to commencement (e.g. changes in upload forms)
- keeping upload forms consistent (where possible)
- assisting APs to differentiate between 2008 activities and 2018 activities (e.g. colour coding batches)

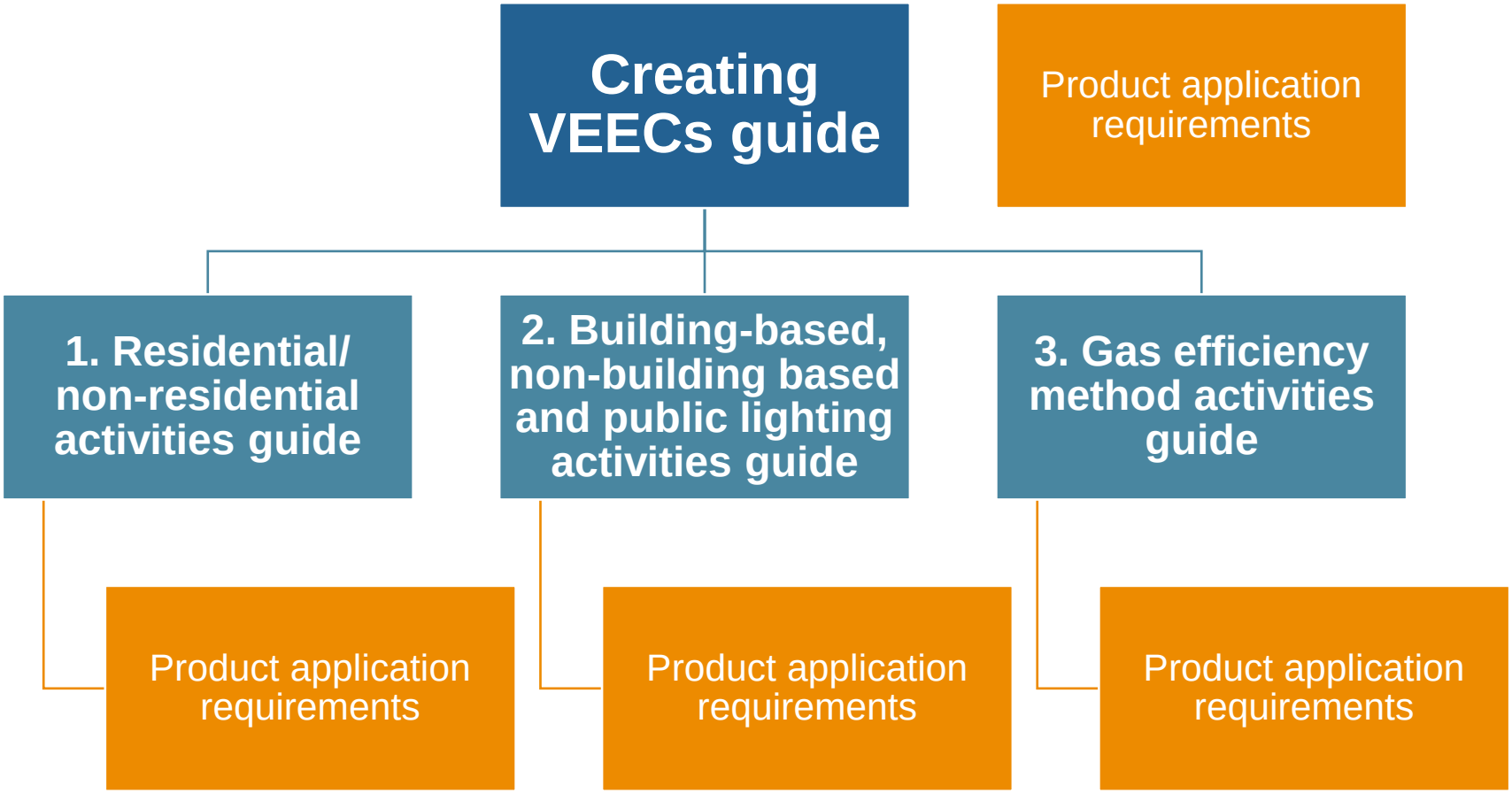
Stakeholder feedback

- 2018 regulatory change is a review/improvement opportunity
- How can we improve/streamline:
  - our guidance documents
  - our application processes
  - our IT systems and upload forms
  - administrative/compliance requirements for existing activities (e.g. lighting design requirements)
- Input in developing our requirements for the new gas efficiency activities

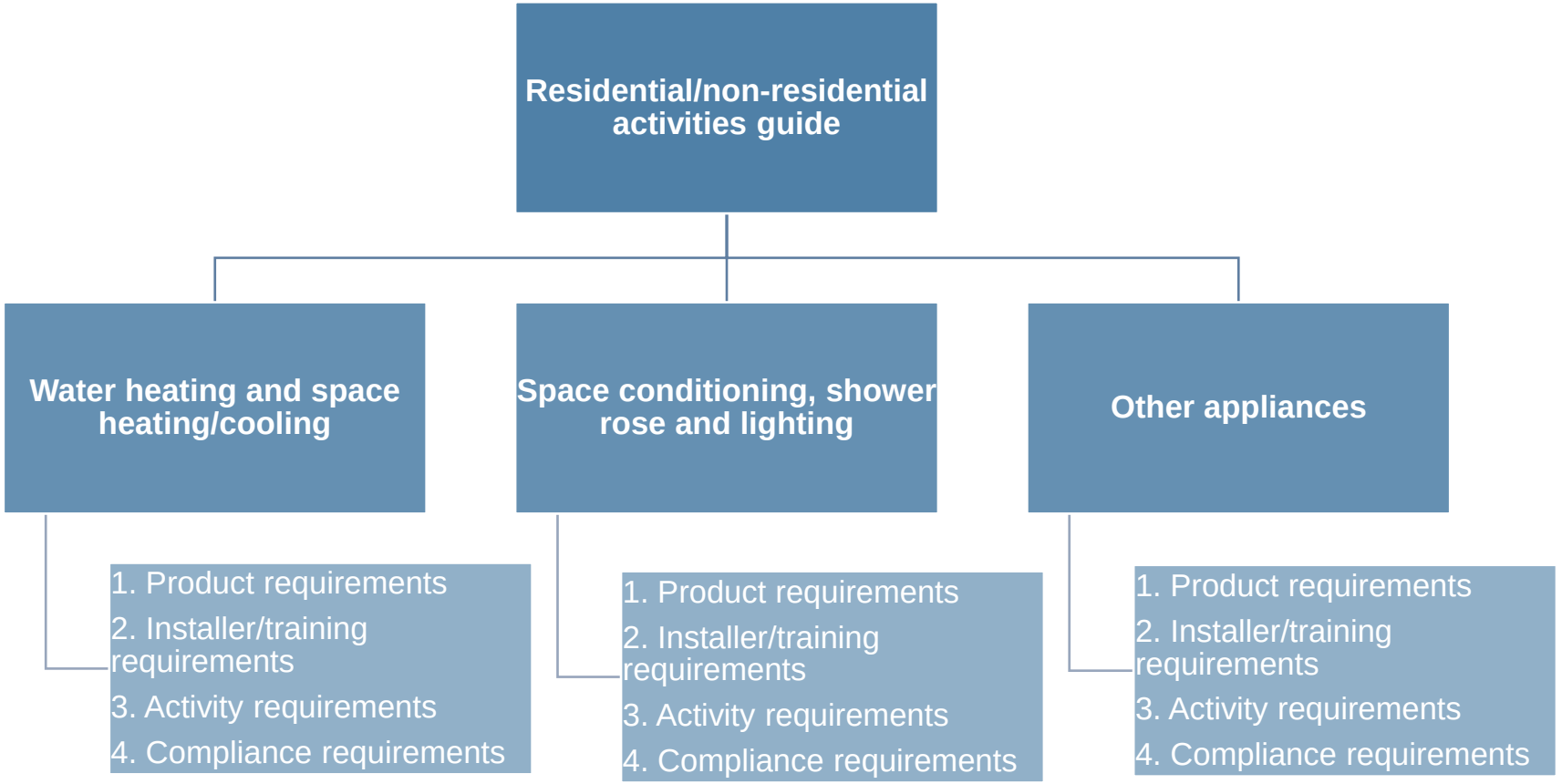
Feedback items for today's workshop

- Changes to our documents
- Changes to our website content
- Proposed administrative measures
- Transitional arrangements
- Lighting matters

Proposed structure - main guidance documents



Document - requirements grouped by activity



Feedback on our documents

- Will above proposed changes be an improvement?
- How can we better structure our documents?
  - Many individual documents vs one big document?
- How do you use our documents?
- What's useful about our documents?
- What can be removed from our document content?
- How can we improve our documents?
  - Improvements to application forms/assignment form templates?

Proposed changes to website content

- To simplify content on website
- To add release date for documents on website
- To create activity based landing pages – e.g. building based lighting
- Easier navigation to documents and forms for each activity

Feedback on our website content

- How do you use our public content pages?
- How can we better structure our content pages?
- How can we improve our content pages?
- When new regulations commence, is it reasonable to place ‘Old guidance documents’ in archived section of website?

Proposed administrative measures

- One installed product per activity in VEEC upload form
- For MEPS/AEMO products, APs will need to ‘submit’ product prior to creating VEECs for us to verify product specifications
  - Minimises data error issues by APs (as system requires a number of inputs to calculate VEECs)
  - Proposing to provide ‘guaranteed’ turn around time (e.g. 5 working days)
  - Propose not requiring nominations
  - Propose not requiring any additional information

Any concerns re above?

Transitional arrangements

Transfers automatically to new register	Commission to determine if product meets new requirements*	Need to reapply to commission (within 6 months)	No need to register anymore
• Water heating • Glazing • Weather sealing • In-home displays • Pre-rinse spray valves	• Space heating • Pool pumps • Incandescent lighting (21) • Commercial lighting (34)	• Shower roses • Gas heating ductwork	• Motors • RDCs • Fridges • Clothes dryers • TVs

*All products initially transfer to register for a transition period before being assessed by the commission and removed, as appropriate.

Feedback on transitional arrangements

- What are key concerns for you?
- What are key issues/matters we should be aware of?
- What is a reasonable ‘transitional’ period?

Lighting activities

Structure changes

- Schedule 34 has been split into three parts:

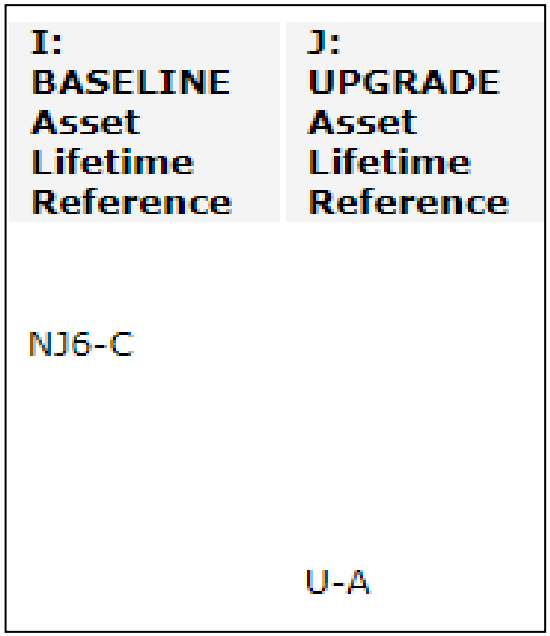
(BB lighting – Part 34, NBB lighting – Part 35, Public lighting – Part 27)

Activity changes

- T5 adaptors no longer eligible as upgrades
- Different format and inputs for abatement calculations
- Asset lifetimes changed
- Lamp Circuit power factors grouped and altered
- Discount factor incorporated
- New space types added/existing space types updated

Proposed improvements to sch 34 upload form

- Reducing the number of zones in the upload form from 50 to 20
- Simplified asset lifetime reference descriptors
- Consolidate two asset lifetime reference fields into one



Proposed improvements to sch 34 upload form

- Consolidate/remove unnecessary fields in the non-J6 and J6 upgrade forms:
  - three space type fields into one for non-J6 upgrades
  - three space type fields into two for J6 upgrades

- Remove lamp category field on upload form

E: Baseline/ Upgrade	F: Lamp Ballast Combination	G: Lamp Category
Baseline	Mercury vapour with magnetic ballast	Baseline - Pre-upgrade

B: Space Type	C: Space Type (Unlisted)	D: BCA Classification
Unlisted space type	Auto workshop	Class 8 (ANZSIC Division C)
Unlisted space type	Auto workshop	Class 8 (ANZSIC Division C)

Feedback on improvements to sch 34 forms

- What other improvements can we make to upload forms?
- What improvements can we make to assignment forms?

Input on requirements for lighting activities

We seek stakeholder/industry input on requirements for:

- Public lighting
- Non-building based lighting
- Building based lighting

In particular, what are suitable:

- lighting design requirements?
- lighting designer qualifications?

Your feedback please

We invite you to provide us your feedback on above matters and other 2018 regulation matters via:-

veet@esc.vic.gov.au, attn: Maureen Goey

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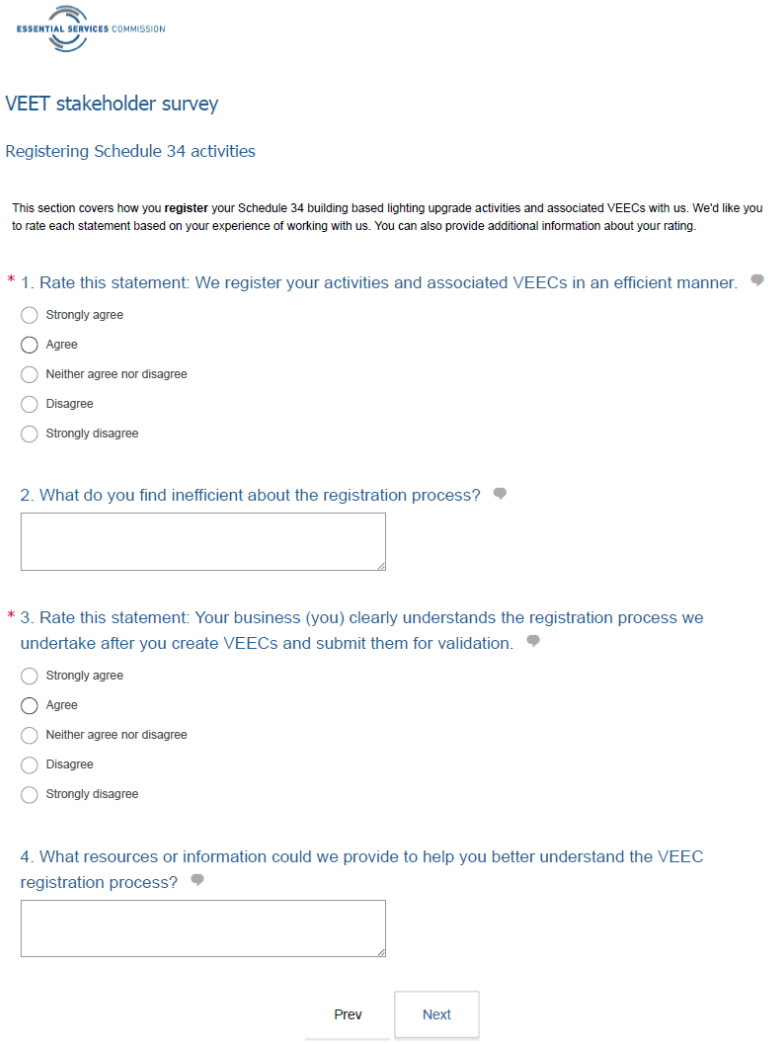
ESSENTIAL SERVICES COMMISSION

Accreditation and VEEC assessments (Registry)

Tony O'Loughlin & Adam Gorton

Victorian Energy Upgrades

VEET stakeholder survey



VEET stakeholder survey

Registering Schedule 34 activities

This section covers how you **register** your Schedule 34 building based lighting upgrade activities and associated VEECs with us. We'd like you to rate each statement based on your experience of working with us. You can also provide additional information about your rating.

* 1. Rate this statement: We register your activities and associated VEECs in an efficient manner.

- ○ Strongly agree
- ◯ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

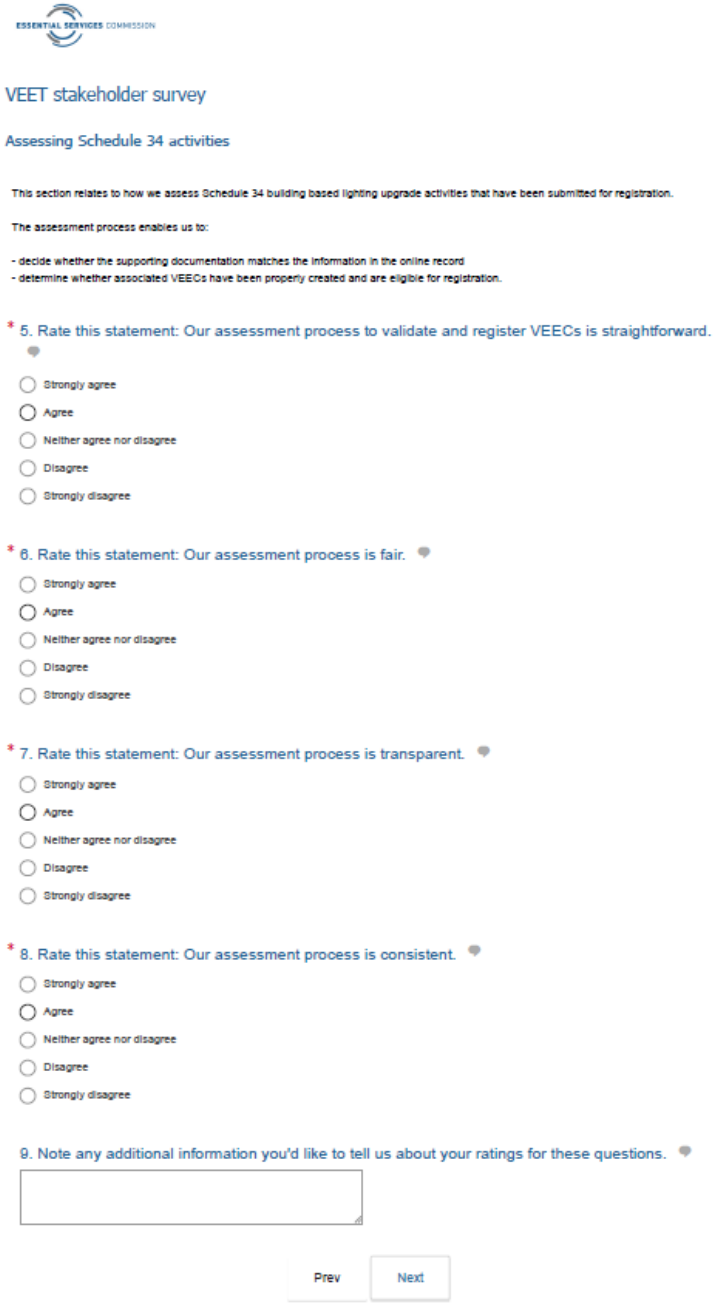
2. What do you find inefficient about the registration process?

* 3. Rate this statement: Your business (you) clearly understands the registration process we undertake after you create VEECs and submit them for validation.

- ○ Strongly agree
- ◯ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

4. What resources or information could we provide to help you better understand the VEEC registration process?

Prev Next



VEET stakeholder survey

Assessing Schedule 34 activities

This section relates to how we assess Schedule 34 building based lighting upgrade activities that have been submitted for registration.

The assessment process enables us to:

- decide whether the supporting documentation matches the information in the online record
- determine whether associated VEECs have been properly created and are eligible for registration.

* 5. Rate this statement: Our assessment process to validate and register VEECs is straightforward.

- ○ Strongly agree
- ◯ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

* 6. Rate this statement: Our assessment process is fair.

- ○ Strongly agree
- ◯ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

* 7. Rate this statement: Our assessment process is transparent.

- ○ Strongly agree
- ◯ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

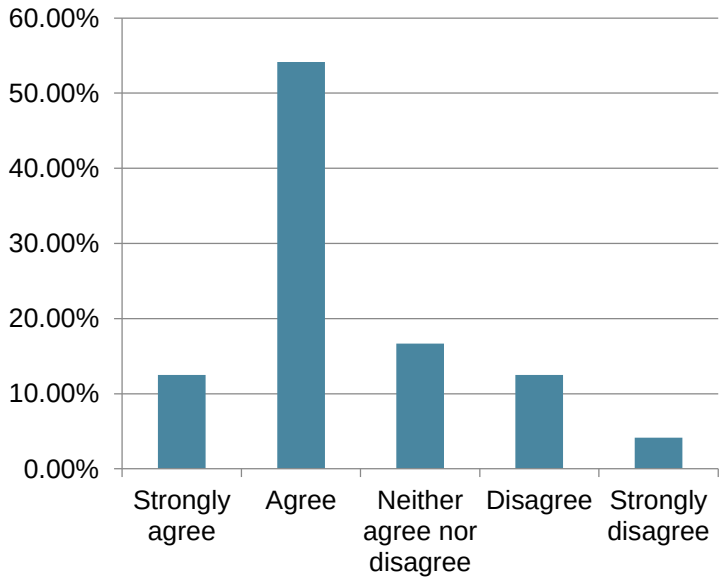
* 8. Rate this statement: Our assessment process is consistent.

- ○ Strongly agree
- ◯ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

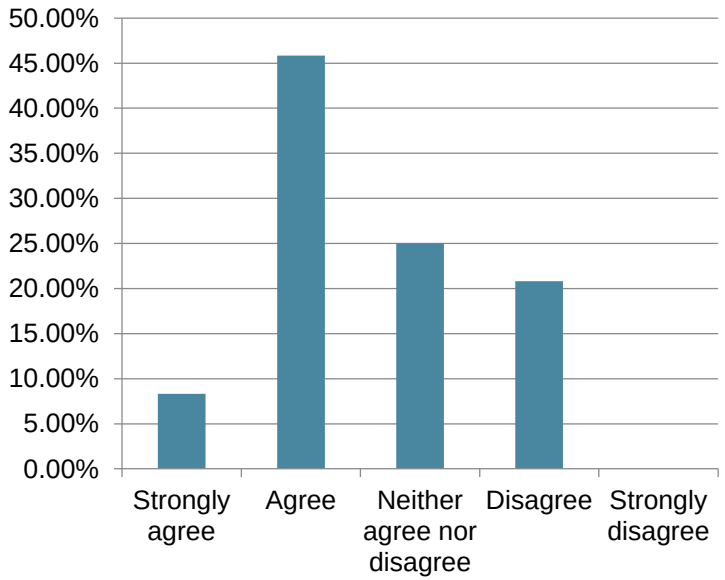
9. Note any additional information you'd like to tell us about your ratings for these questions.

Prev Next

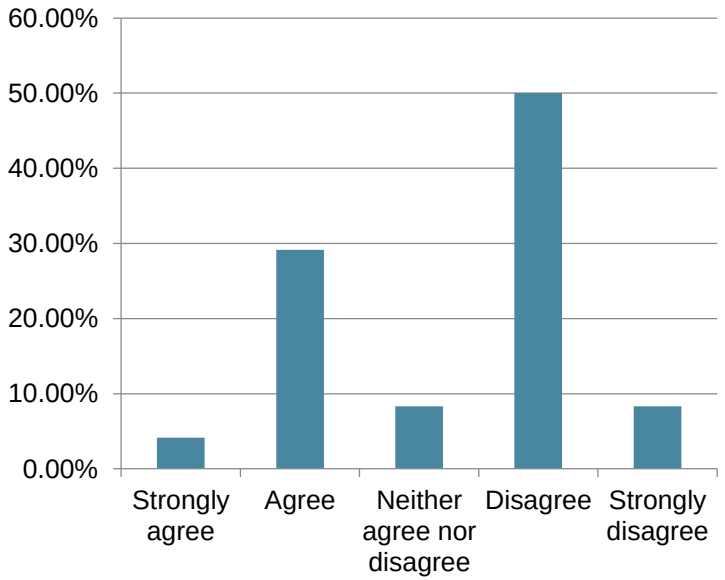
Survey questions 5–9, Assessment process



Fair

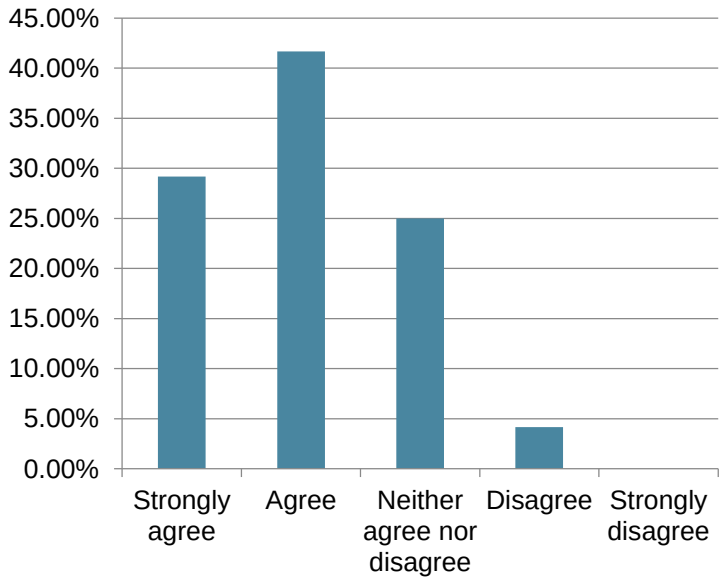


Transparent

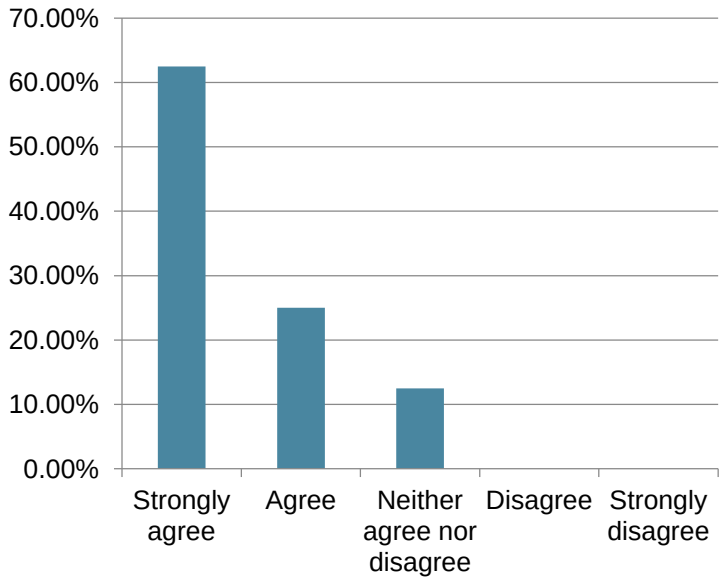


Consistent

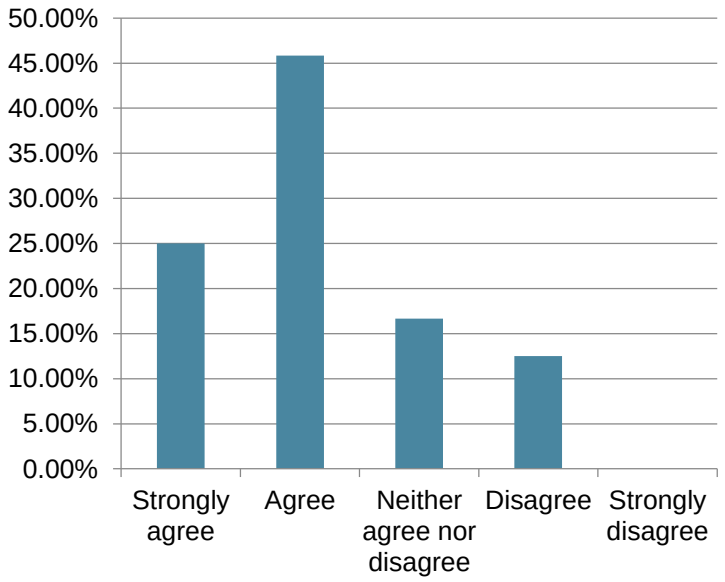
Survey questions 10–15, Target days



Adjusting



Reducing



Increasing

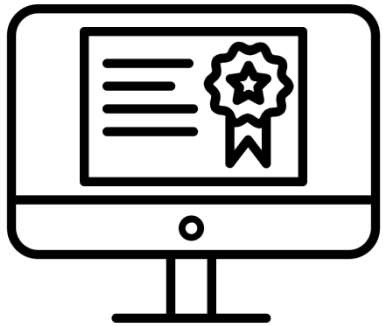
Survey feedback

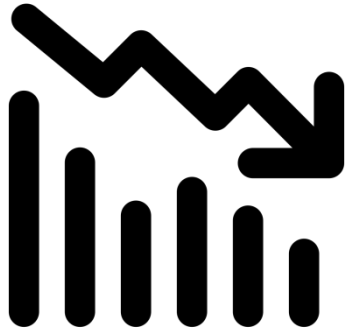
Theme of feedback	Number of comments
Communication	31
Transparency	5
Fairness	10
Consistency	30
Registry or VEET website process	41
Could the issue potentially be rectified through stakeholder engagement	21

Action items

- Response to stakeholders
- Workflow chart
- Simplify documents into fact sheets
- Abbreviating activity notes – using plain English
- Reformat initial RFI and secondary RFIs
- FAQs – Registry to regularly update
- Registry "forum"
- Decision-making matrix
- Dummy assessments
- Continuous process improvements
- Glossary of terms for Registry
- Terminology
- Internal communication between A&C and Registry
- Internal and external checklists

Flexible target days trial

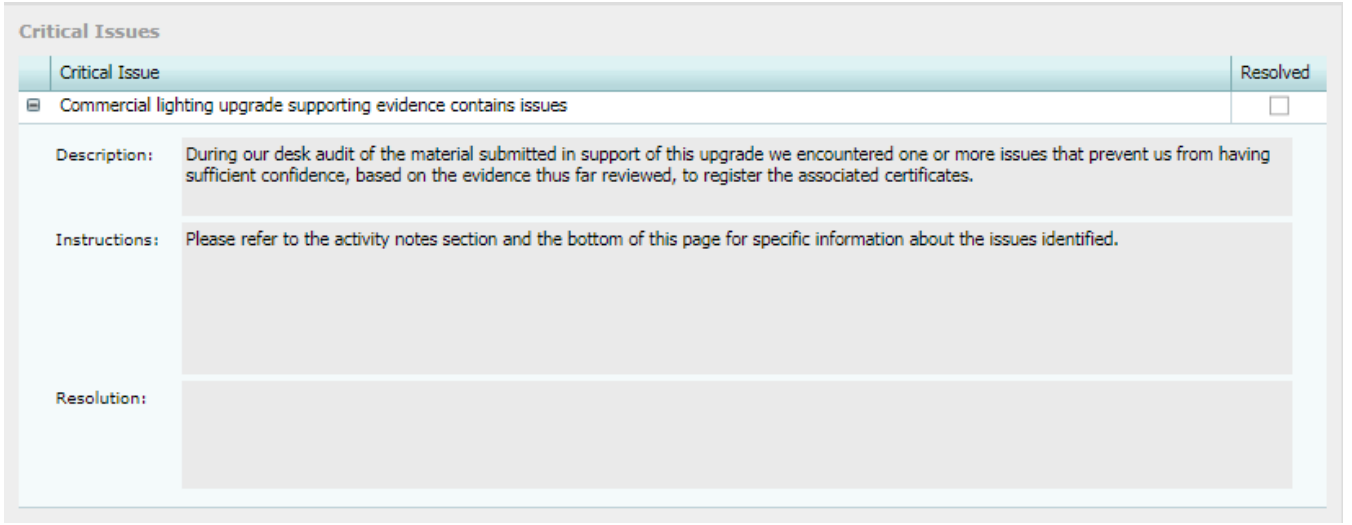


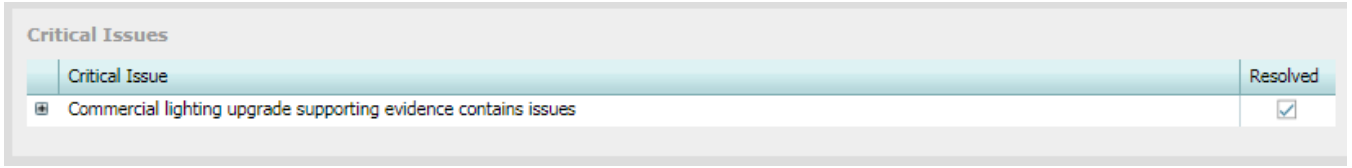


Flexible target days trial

The assessment of each activity has one of three outcomes. The activity is:

- accepted with no critical issues, or
- accepted with **resolved critical issues**, or
- withdrawn with **unresolved critical issues**.



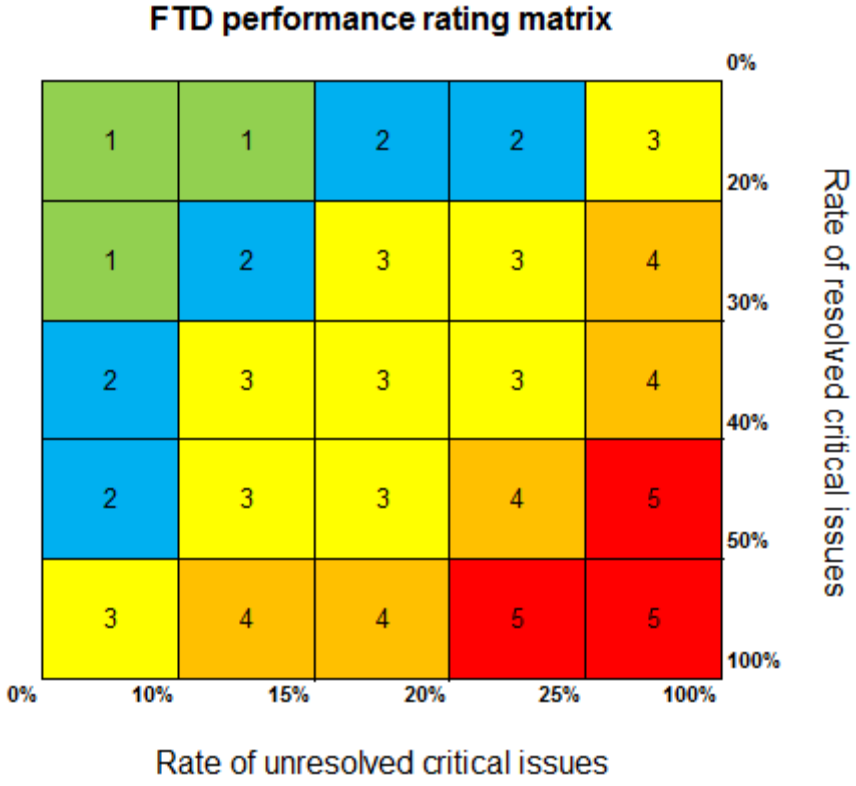


Flexible target days trial

$$\text{Rate of resolved critical issues} = \frac{\text{Number of accepted activites with resolved critical issues}}{\text{Total number of assessed activities}}$$

$$\text{Rate of unresolved critical issues} = \frac{\text{Number of withdrawn activites with unresolved critical issues}}{\text{Total number of assessed activities}}$$

Performance rating	1	2	3	4	5
Target days	7 days	14 days	21 days	28 days	42 days



Flexible target days trial

We will determine your target days every **four weeks** using:

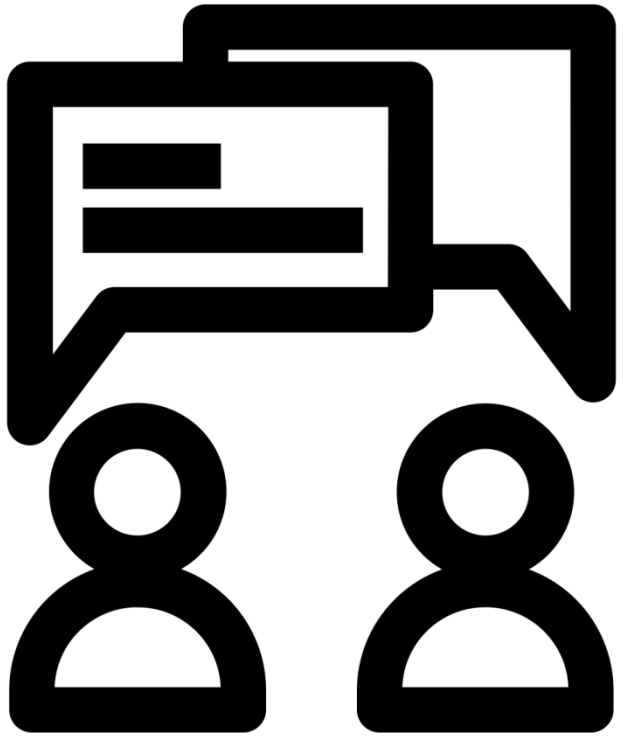
- activities we completed a validation assessment on in the **previous 16 weeks**
- activities with a status of **withdrawn**, **accepted** or **registered**
- a minimum of **10 assessed activities**.

Other Registry changes

As part of the flexible target days trial we have introduced the following changes to how we process Schedule 34 Non J6 activity submissions:

- maximum activity batch size is now 10,000 VEECs (currently it is 12,000 VEECs)
- activity batch assessment quota is ten percent of the total number of activities in the batch (currently it is five percent)
- activity batch assessment quota maximum is five activities per batch (currently it is three activities).

Registry discussion



ESSENTIAL SERVICES COMMISSION

Audit & Compliance

Luli Zyka
Manager, Audit and Compliance

Victorian Energy Upgrades

Agenda

- Overview
- Audits
- Complaints
- Compliance issues
- Relevant entity compliance
- Register of SAP review

Overview

VEET Audit and Compliance audit process

Audits


365
field audits
144
desktop audits
204
telephone audits
2
pre-accreditation audits
28
relevant entity audits
15
audits completed
5
escalations completed
6
first creation assessments
15
additional activity accreditations

Complaints

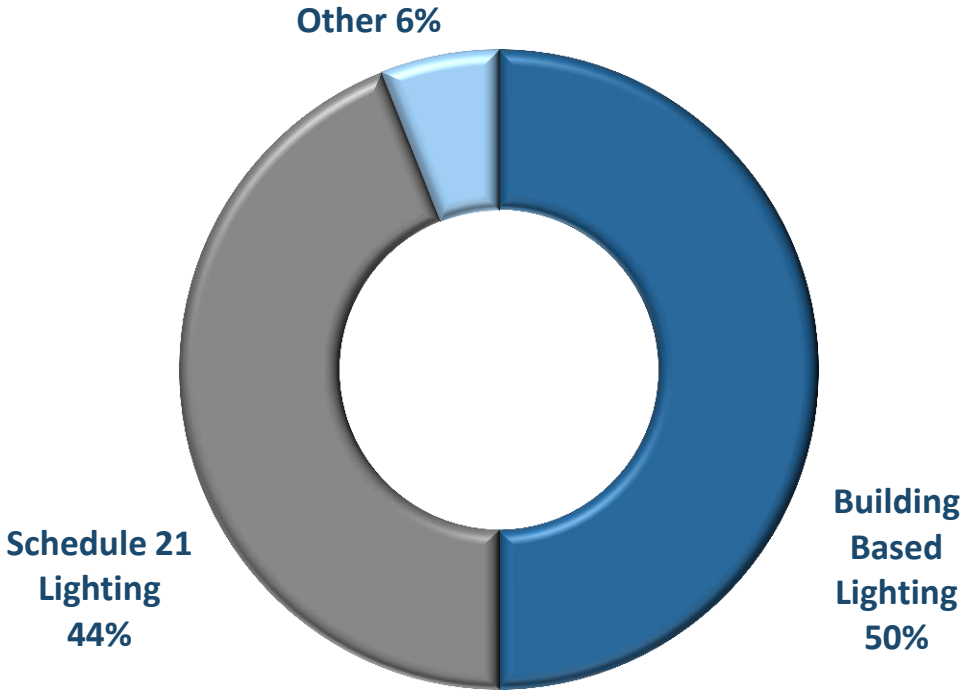
Main issues

Building based lighting

- Incomplete installations – e.g. tubes
- Highbays - faulty products and sensors
- Paperwork – issues with signatures or not provided

Schedule 21

- Failures and flickering
- EMC – TV interference
- Not honouring warranties

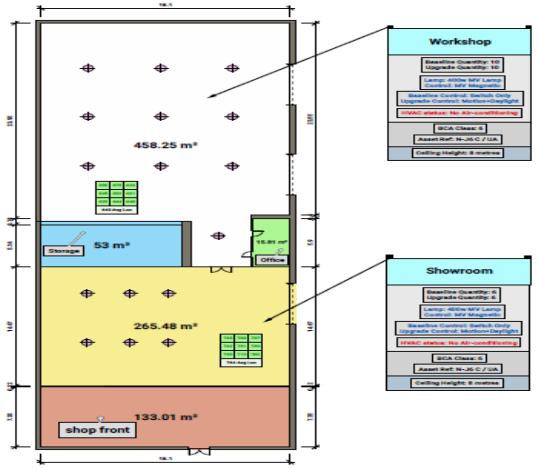


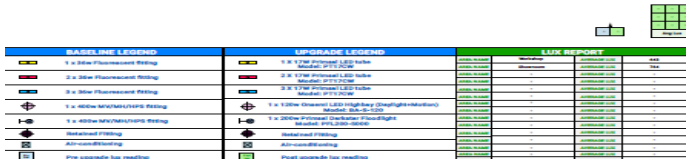
Complaints reach us mainly due to poor customer service and lack of follow up

Compliance issues

Building based lighting upgrades

APs must be able to prove the existence and nature of all pre-existing (baseline) lighting equipment (i.e. lamps, control gear and LCDs).





Compliance issues

2017 Relevant entity compliance

- 28 energy retailers identified with liability
- review underway
- staff working with independent auditors
- obligatory surrenders to be accepted late July

Register of Scheduled Activity Premises review

- Review of register of scheduled activity premises
- Goal is to ensure that list is accurate and comprehensive
- AP's need to
  - have processes in place to check the Register of SAP prior to undertaking a VEET upgrade
  - ensure that if upgrade is taking place at SAP site that occupier of the site provides commission with written notice to opt in to the VEET Scheme

Questions

ESSENTIAL SERVICES COMMISSION

Technical Services Workshop

Gabrielle Henry Manager, Technical Services

Nilanga De Silva Project Officer

Ayona Sur Project Analyst

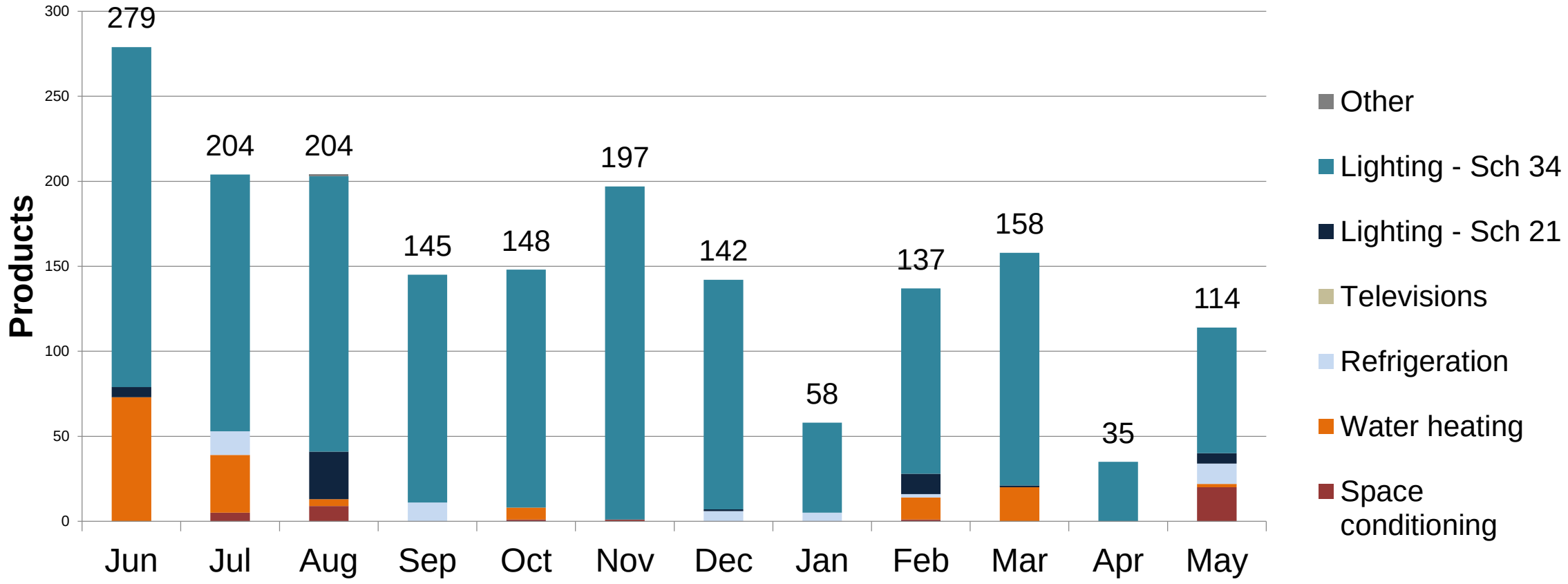
Victorian Energy Upgrades

Agenda

1. Product approvals
   - past year
   - current status
2. How we're managing the application queue
3. Updates to product application guidance
4. 2017-18 independent product testing program
5. We'd like your feedback

1. Product approvals

Products approved – past year



1. Product approvals

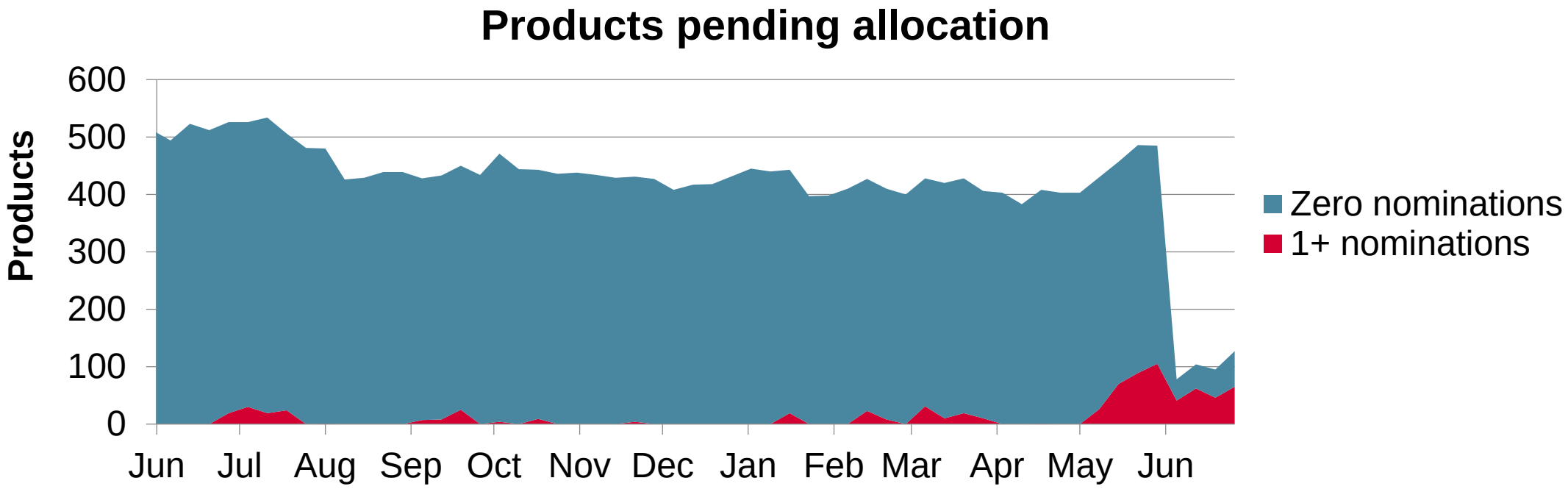
Current status

- Applications with nominations are allocated for assessment within days

Of complete, nominated products approved:	September 2017	May 2018
Schedule 34	85%	85%
At least one RFI	50%	54%
Approved within a week	40%	37%
Approved within two weeks (average)	59%	60%
Approved within 1 month	90%	91%
Shortest approval time	0.7 days	0.6 days
Longest approval time	64 days	49 days

2. How we're managing the application queue

1. Only processing applications with nominations
2. Limiting applications to two RFIs
3. Returning old applications with no nominations



2. How we're managing the application queue

Why only process applications with nominations?

- To prioritise the assessment of the product according to likelihood of use under the scheme
- To reduce the time between product application submission and approval to install the product
- To incentivise APs to nominate *only* those products which they genuinely intend to install as part of a prescribed activity
- To assist with effective prioritisation of the queue

2. How we're managing the application queue

Why only two requests for further information?

- To ensure quick, efficient assessment of all product applications
- To ensure we are fair and transparent to all product applicants who have been asked for additional information twice
- To keep the product application queue under control
- To ensure analysts' time is efficiently used

2. How we're managing the application queue

Why did we return old applications with no nominations?

- To ensure the list of products with no nominations remains manageable and does not mislead the market that there are products awaiting approval
- To ensure APs are aware of the product nomination policy
- To check if APs are still interested in their products being assessed
- To enable APs to take action with regards to their products – to either reapply or withdraw their product if its no longer applicable for installation in the market (e.g. the product has been customised or updated)
- To prioritise the assessment of products according to likelihood of use as per the product submission date

2. How we're managing the application queue

What you can do to ensure your product is assessed quickly

- Submit a complete set of documents; downloadable files (pdf/jpeg/doc); simple file names; no special characters (?,/,#,!)
- Only attach relevant files; mention test report type in file name;, include product names if application has multiple products
- Nominate your product application
- Test report(s) identify product(s) with brand and model exactly as applied for and described in other documentation
- Brand and model numbers listed on the manufacturer's declaration consistent with documentation and model applied for
- Brand and model numbers on the safety certificate or ISTMT report exactly match model applied for
- Laboratory producing the test report is appropriately accredited
- Tests are conducted in accordance with the relevant standards in commission requirements
- Test sample size is as specified in the standard in commission requirements

3. 2017-18 independent product testing program

- Samples chosen based on potential scheme impact
- 6 samples of each product have been collected
- Testing currently underway

Testing program	Products
Performance	15
Safety	3

4. Updates to product application guidance

Updates to the explanatory note – lodging a product application

- easier to navigate
- clarified some content based on FAQs
- ISTMT and IP testing simplified based on expert advice – in some cases, applicants can submit a representative test report
- explained the process to apply to modify the Register of products
- combined non-building based (NBB) lighting product requirements for simplicity
- introduce new requirements for Schedules 21 and 34 – lighting upgrade and Schedule 23 - evaporative cooler

4. Updates to product application guidance

A new lighting definitions section introduced

- lighting-specific definitions are introduced in section 1.2 for Schedules 21 and 34

A new lighting-specific introductory section: Chapter 5

- introduced examples of various lighting categories – section 5.1
- lighting applications under project-based activities – section 5.3
- representative test reports for ISTMT (section 5.4) and for IP tests (section 5.5)
- how to apply to have an approved building based (BB) lighting product re-categorised under non-building based (NBB) lighting – section 5.6

4. Updates to product application guidance

Requests to modify or remove an approved product on the Register of products

- the process is explained in section 4.2
- the request should be emailed with the required information to veet@esc.vic.gov.au

4. Updates to product application guidance

Representative product testing for ISTMT – section 5.4

Acceptable	Not acceptable
• Specified instances where differences between products are unlikely to affect the ISTMT result.	• The differences between the products are likely to affect the ISTMT result.
• We will accept a representative ISTMT report for products with the same wattage, LED chip and electrical circuit, but minor differences such as: ○ lens material (glass vs plastic) ○ type of cap (B22 vs E27), ○ beam angle, light distribution ○ LED chip differences such as CCT, CRI, chromaticity coordinates, voltage bin, or flux bin.	• We will not accept a representative ISTMT report in the following circumstances: ○ products with different chips or different wattages ○ additional electrical circuits (motion sensors, Wi-Fi components etc.) ○ different thermal masses ○ dimmable or non-dimmable versions ○ varying LCPs.

4. Updates to product application guidance

Representative product testing for IP tests – section 5.5

- there is a requirement to submit an IP test report for lamps designed for outdoor environments (reflector lamps and NBB lighting lamps)
- we will *accept* a representative test report if all the following criteria are met:
  - lamps have the same external construction (housing)
  - laboratory confirms that the test results apply to all models listed in the test report
  - the safety certificate confirms the model and corresponding IP rating for all models

4. Updates to product application guidance

Integrated product requirements for Schedule 34 – non-building based (NBB) flood, street and public lighting

- requirements for LED floodlights, street and public lighting have been combined to simplify the product requirements
- suitability for outdoor environments (testing to AS/NZS 60598.2.5) is *only applicable* to floodlights
- testing for correlated colour temperature (CCT) is *optional* for floodlights

4. Updates to product application guidance

Applying to have an existing building based (BB) lighting product approved under non-building based lighting (NBB) – section 5.6

- you can now apply to have existing BB lighting products approved for NBB lighting
- online applications can be lodged
- please attach all relevant documents similar to a new application

4. Updates to product application guidance

New product requirements and transition periods

Schedules 21 and 34 – lighting upgrade

- ISTMT report must explain how the forward drive current of the LED chip was established. This requirement is mandatory for all ISTMT test reports **produced on or after 1 August 2018**

Schedule 23 - ducted evaporative cooler

- We now require a test report showing compliance with AS 2913-2000. This requirement is mandatory for all product applications **submitted on or after 1 August 2018**

5. We'd like your feedback

- What changes should we be aware of in the products market?
- Are there areas where our guidance is not keeping pace with these changes?
- Are there areas where our guidance isn't clear? What would make our guidance more user-friendly?
- We're considering ways to ensure only quality products are installed under the scheme. What evidence (such as test reports) do you currently have which may support such a requirement?
- We're considering creating a product application FAQ document. What topics would you like to see covered?

Questions

ESSENTIAL SERVICES COMMISSION

PBA M&V Workshop

Victorian Energy Upgrades Forum - C/18/8111

Andy Sharp

29 June 2018

Victorian Energy Upgrades

Agenda

1. Introduction
2. Background to PBAs & M&V - Recap
3. Case study concept
4. Project decision point case study examples

- Planning considerations
- Reporting considerations

5. Q&A
6. Lunch break
7. Conclude M&V session

- M&V Hot tips

8. Benchmark rating development – update
9. Benchmark rating questions and concerns
10. Q&A
11. 1-1 Sessions

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What are project-based activities (PBA)?

What are Project-based activities (PBA)?

A broad range of bespoke energy efficiency projects in the following environments:

- residential (~Treatment and Control)
- commercial (~Benchmark rating)
- industrial (~Measurement and Verification).

Project-based

Multiple energy efficiency measures contained within one project.

Technology neutral

Can be (almost) anything as long as (grid electricity or gas) abatement can be achieved.

How is PBA different?

PBA is different from existing Victorian Energy Upgrades activities in the following key ways:

Measurement

Actual before and after measurements are used to calculate certificates (VEECs)

Technology

Activities are not limited to specific technologies.

“Upgrade”

Projects don’t need to be an “upgrade”. They can be process, set-point, or behaviour changes, or any other eligible abatement.

Product List

There is no requirement to use products from a list approved by the ESC, except for where lighting equipment has been installed.

Decommissioning

There is no decommissioning requirement, except for where lighting equipment has been installed.

PBA uses different ‘methods’

Method	Effective date
Measurement and verification	19 June 2017
Benchmark rating (e.g. “NABERS”)	Coming soon
Treatment and control	TBC
Other	?

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Measurement and verification

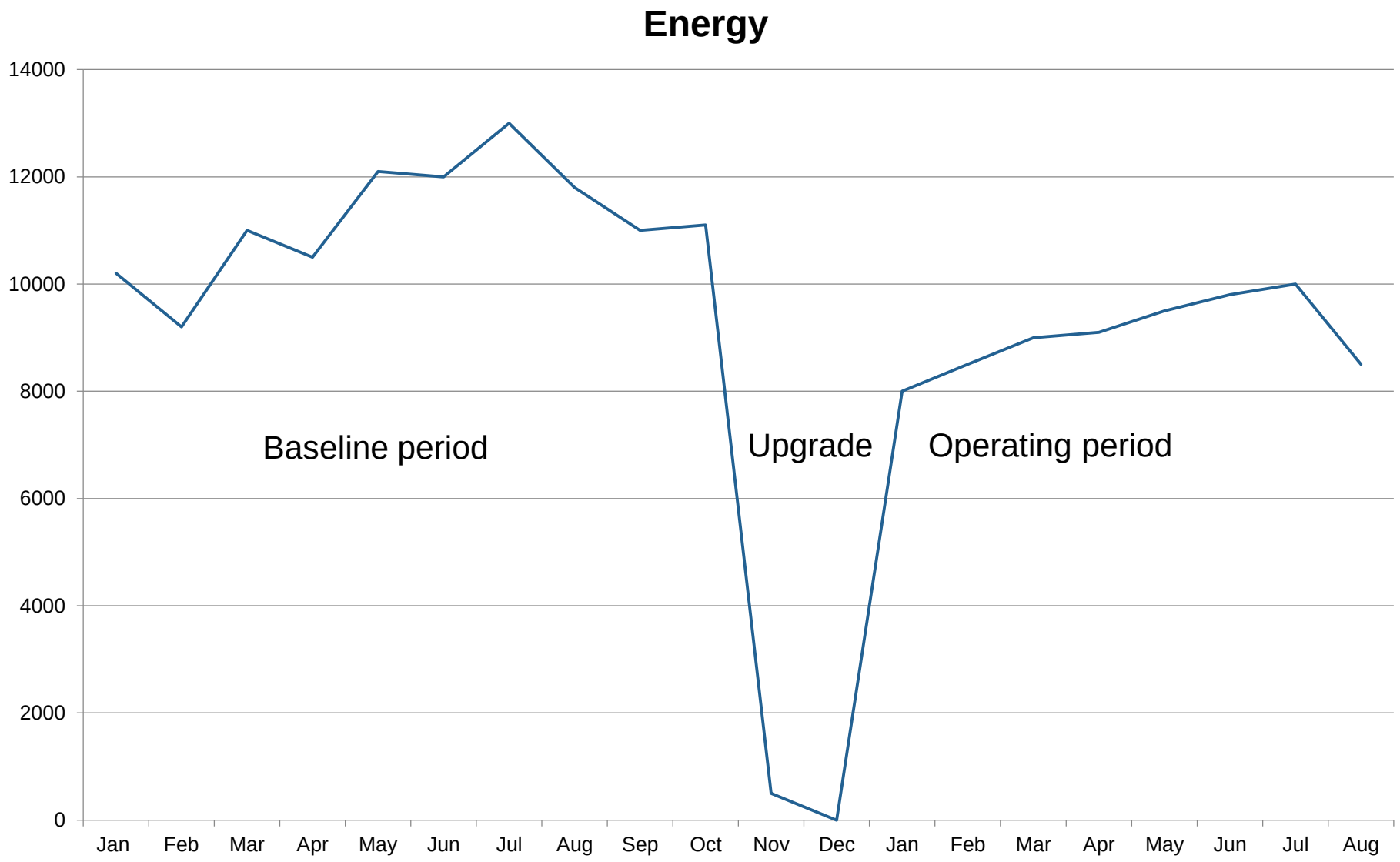
Measurement and Verification

1. Measure ‘baseline’ energy use
2. Undertake work
3. Measure ‘impact’ energy use
4. Verify and report the reduction in energy use

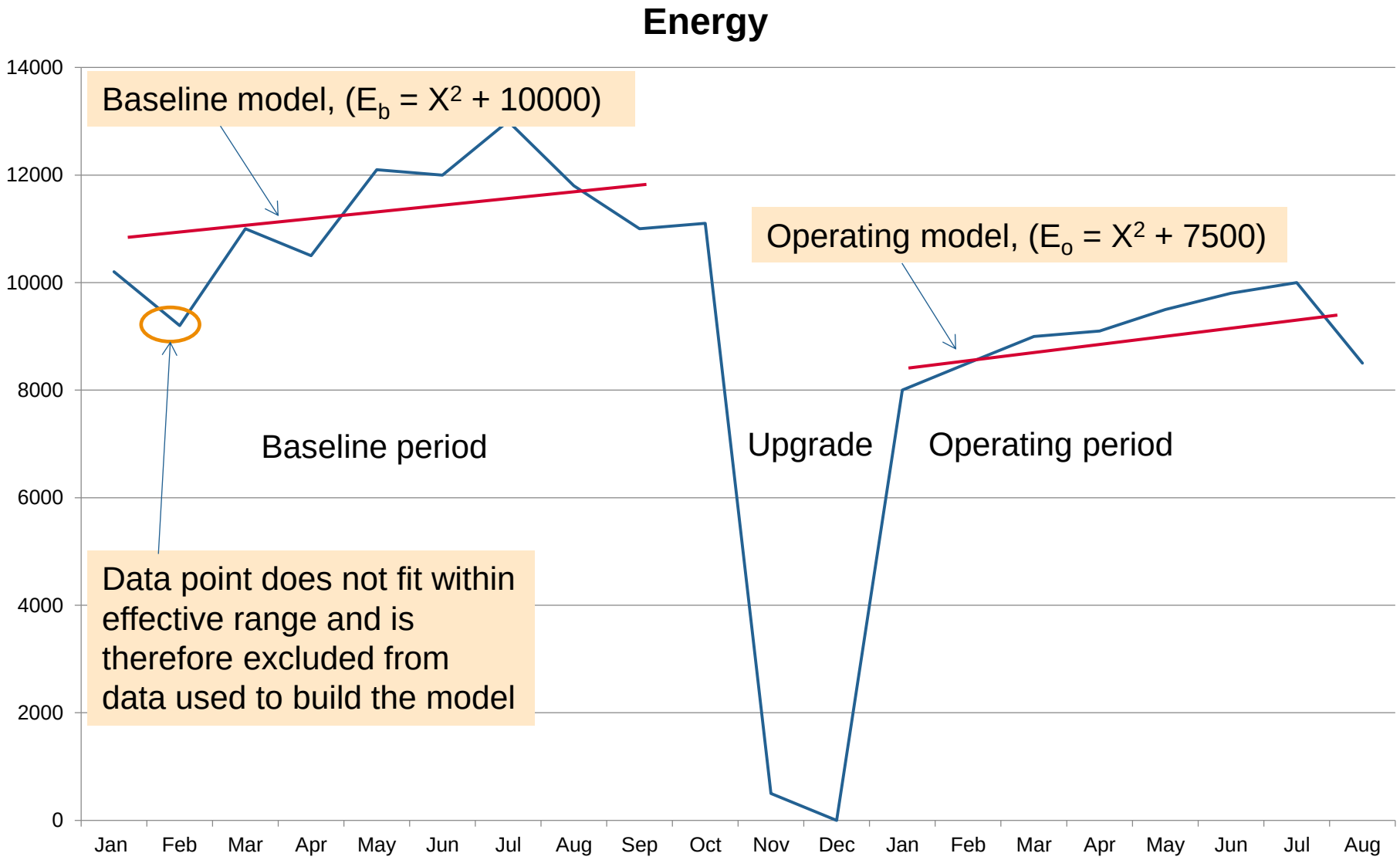
Likely to be large, mainly industrial projects

May involve upgrade of bespoke or custom equipment

What is M&V really?



Normal year


Energy
14000
12000
10000
8000
6000
4000
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0
Jan
Feb
Mar
Apr
May
Jun
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Aug
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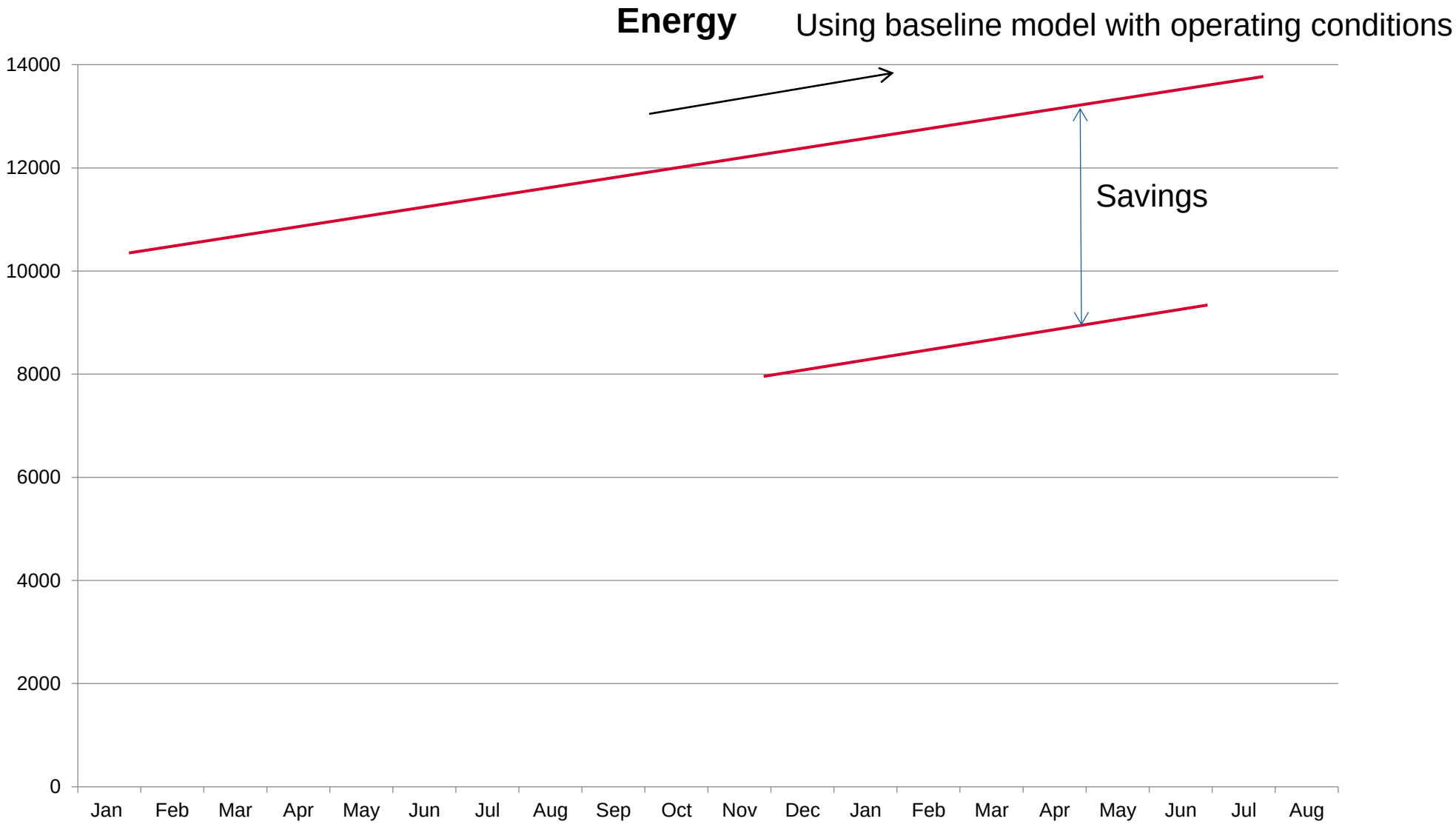
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Baseline model, ($E_b = X^2 + 10000$)
Operating model, ($E_o = X^2 + 7500$)
Baseline period
Upgrade
Operating period
Data point does not fit within effective range and is therefore excluded from data used to build the model

Normal year


Energy
Using baseline model with operating conditions
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Savings
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Jun
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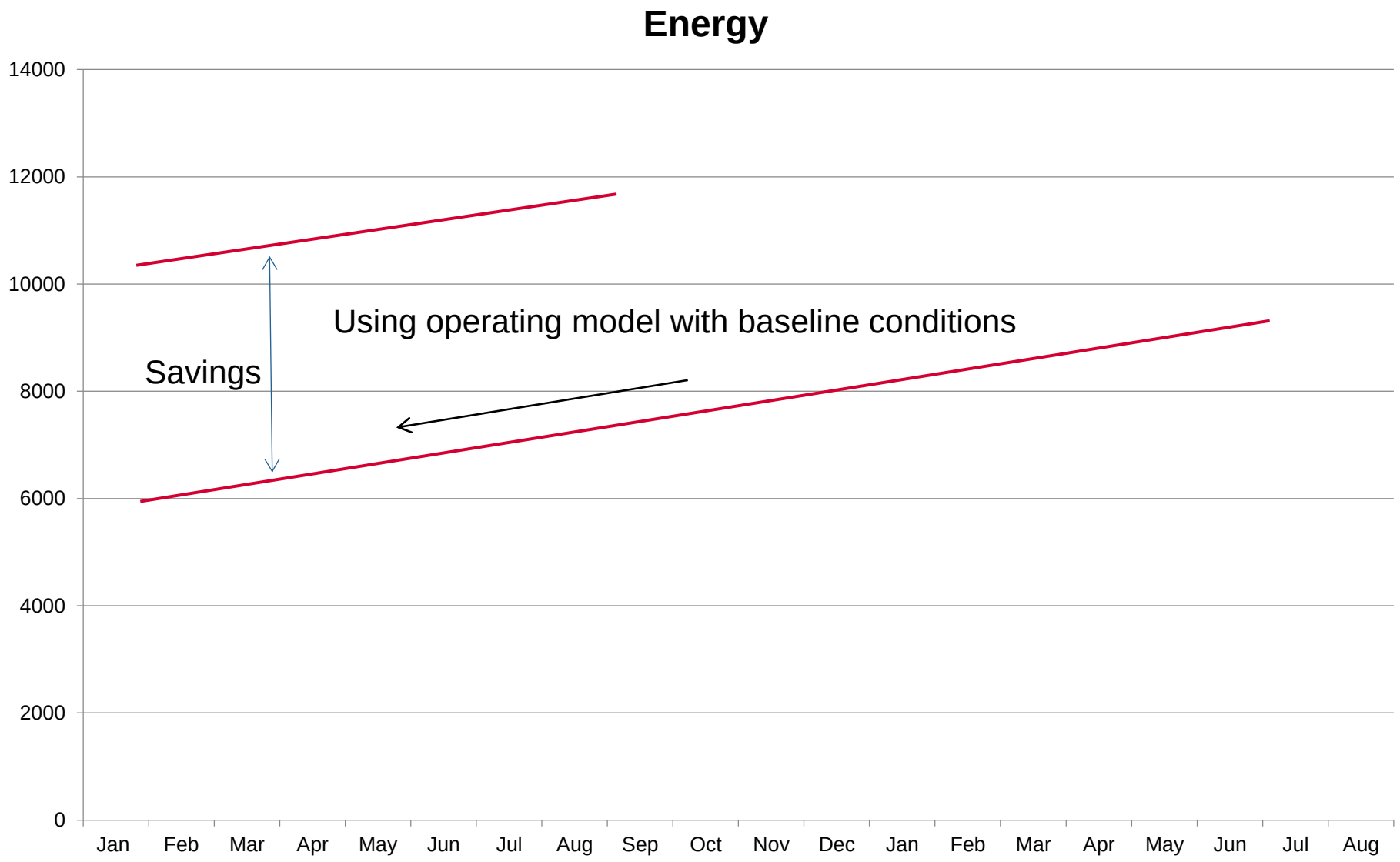
Normal year


Energy
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Savings
Using operating model with baseline conditions
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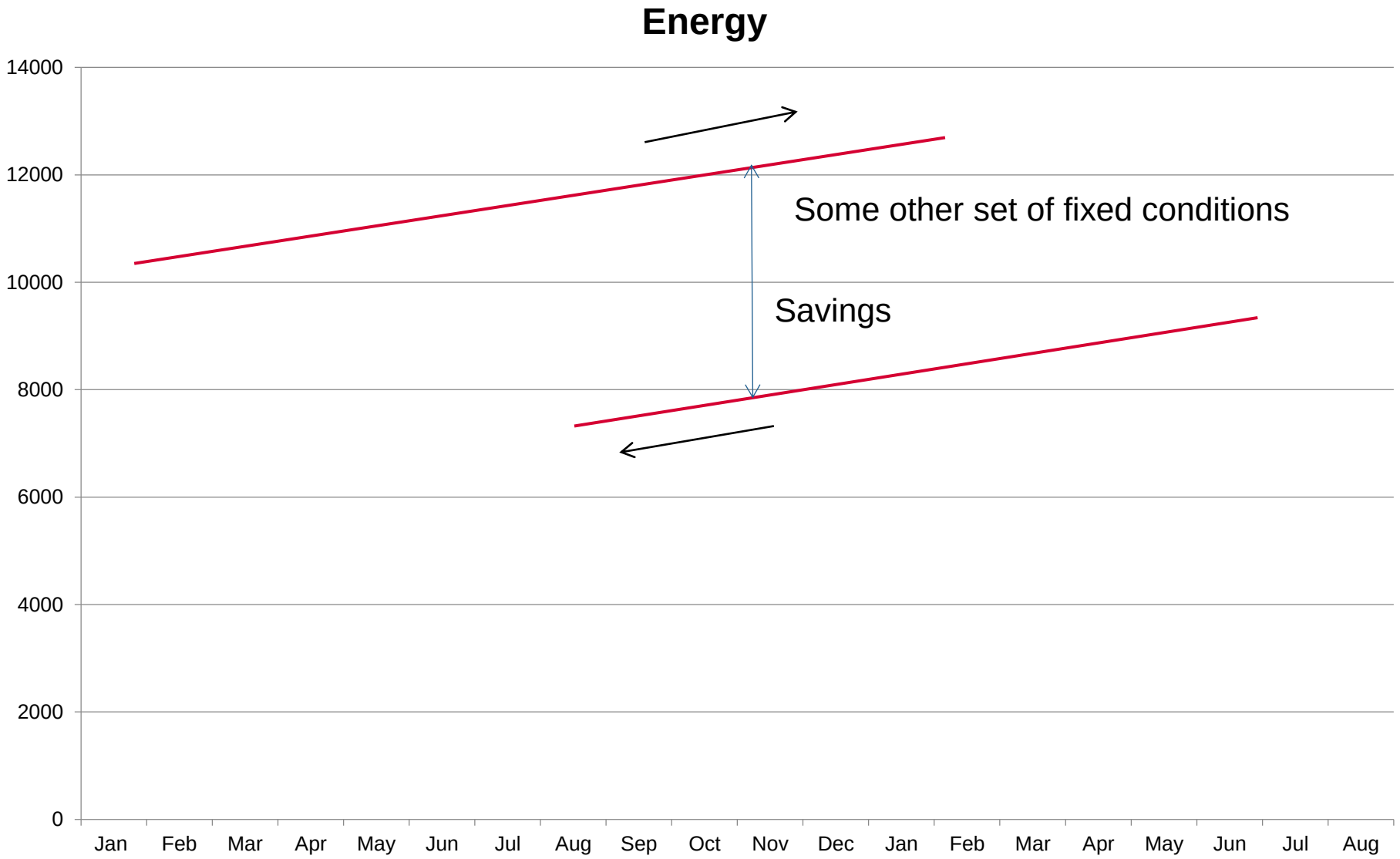
Normal year


Energy
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6000
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2000
0
Some other set of fixed conditions
Savings
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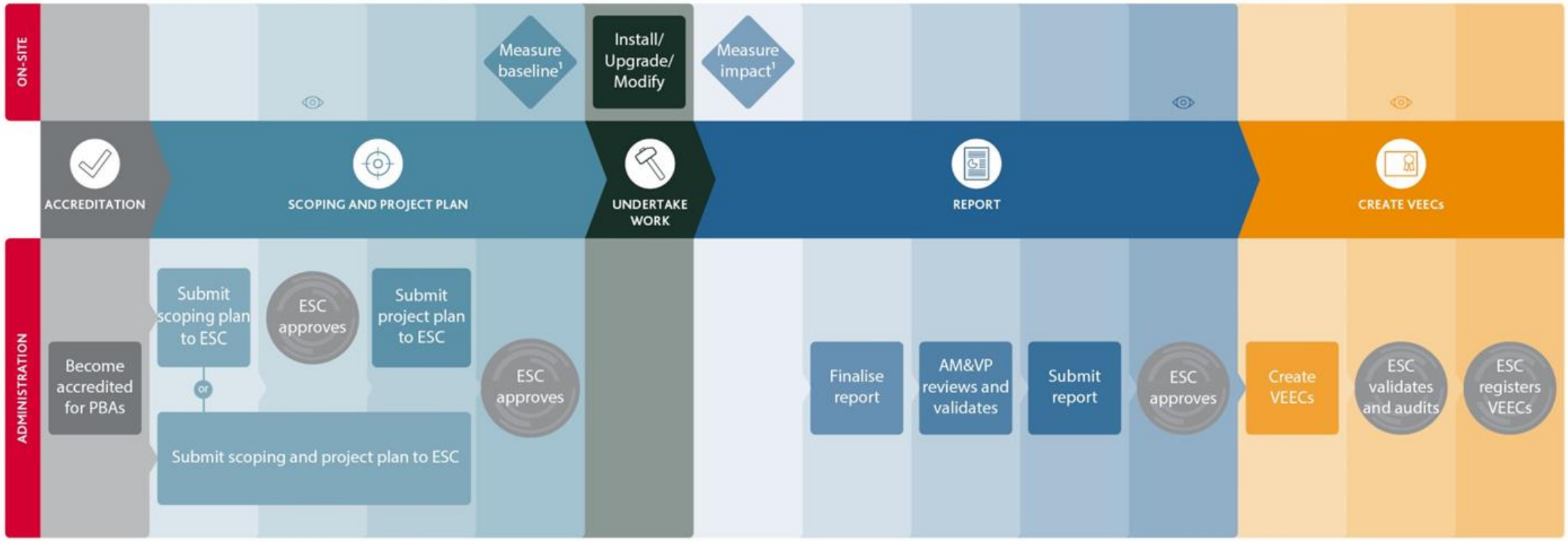
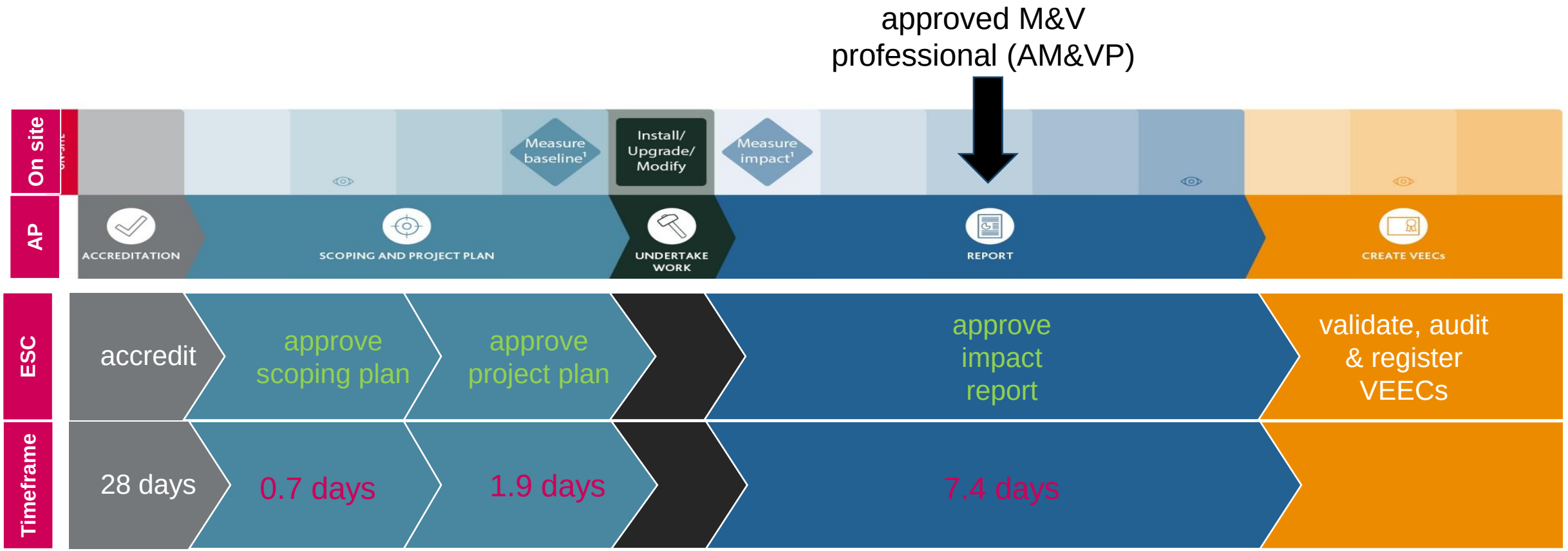
Aug

Measurement and verification (M&V) process

There are 3 touch points with the commission for M&V projects:



Measurement and Verification functions



M&V assistance

M&V assistance available:

- The department of environment, land, water and planning (DELWP) are offering grants of up to $25,000 to assist businesses to collect baseline data and prepare a business case. These close **26 July**:

  1. For further information, see the ‘custom upgrades grants’ section at: https://www.energy.vic.gov.au/energy-efficiency/victorian-energy-upgrades/project-based-activities

- DELWP have also published a useful M&V training guide and workbook tool to assist stakeholders in understanding M&V principles and calculation methods:

  1. For further information, see the ‘M&V training manual and workbook’ section at the same URL as above.

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The Case Study Concept

For this workshop

Case study concept

The following slides will be examples of decision points reached during the planning and implementation of some hypothetical projects for PBA M&V.

These will be presented in CAR format:

Context

Action

Result

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Example decision points

Planning considerations

Decision points covered – Planning considerations

Planning considerations

- Separate scoping/project plans?
- Multiple boundaries & persistence models
- Choosing the IPMVP option
- Setting the baseline
- Minimising potential for future changes
- Choosing the method of VEEC creation
- Metering – Cost vs Accuracy
- Independent variables – what to use
- Site constants – what to use
- Forward creating up to 3 times
- Sampling

Separate scoping and project plans?

Introduction:

- Before starting any project applications, consider that you have the choice to apply for scoping and project plan approval separately or together:

1. Applying separately means you cannot submit an application for a project plan until the scoping plan has been approved.
2. Applying together means that you could start project works earlier (as soon as the scoping plan part has been approved).
3. Applying together will require more upfront effort as the M&V plan component of the project plan needs to be specific and may require expert assistance to develop.

Example – Separate scoping and project plans? - 1

Context:

- Bob has a sawmill. He has a project to install VSDs on some hydraulic ram pumps. He is unsure whether to:

  1. Apply for scoping and project plan separately.
  2. Apply for both at the same time.

Example – Separate scoping and project plans? - 2

Actions:

- Bob undertakes an assessment and finds:

1. Applying separately is likely to take longer than applying together.
2. Applying separately gives him earlier surety that the project is likely to be eligible.
3. His project team have no prior experience in working on the Victorian Energy Upgrades program (although they have lots of engineering expertise).
4. The resource requirement and cost of developing his M&V plan is likely to be relatively high (compared to a scoping plan) due to the relative inexperience of the team.
5. Although Bob would like the project to be started ASAP, he has no time limit on this.

Example – Separate scoping and project plans? - 3

Result:

- Bob decides to apply separately for the following reasons:

1. Not having completed a similar project under the Victorian energy upgrades program previously, he does not feel confident that his team fully understands the process.
2. He wants some surety that his project is likely to be eligible before going to the trouble of expending money and resources developing an M&V plan.
3. He is happy to wait slightly longer for the project to start if it gives him confidence that he is not wasting time and money.

Multiple boundaries and persistence models

Introduction:

- There may be numerous ways to define the boundary of your project:

1. A project with multiple ECMs may have one boundary which encompasses all activities, or it may have several smaller, separate boundaries which encompass all activities.
2. Where a project has multiple activities with individual boundaries, there should be no interaction between the boundaries.
3. Measuring multiple boundaries may be more expensive due to the measurement requirements.
4. When using forward creation, a decay factor, or persistence model must be used.
5. Multiple activities within the same boundary must use the most conservative model.

Example - Multiple boundaries & persistence models - 1

Context:

- James has a project which includes a diverse range of ECMs (Energy Conservation Measures). He wants to forward create and is unsure how to deal with the persistence model.

  1. He can use IPMVP option C and take the most conservative persistence model.
  2. He can use IPMVP option B and create measurement boundaries around each ECM and use individual persistence models, summing these at the end of the calculations.

Example - Multiple boundaries & persistence models - 2

Actions:

- James compares cost vs benefit for these two options and finds:

1. Option C can be done at very little cost
2. He already has the baseline data for using option C
3. Measuring the individual ECMs will cost the project an extra $5k
4. Using option B is likely to add 4 months to the project as the baseline will still need to be measured.
5. Applying the most conservative persistence model to all ECMs is likely to result in $15k worth of certificates less than if he was able to use individual models.

Example - Multiple boundaries & persistence models - 3

Result:

- James decides to use Option C and use the most conservative persistence model for the following reasons

1. Option C is easier to implement
2. The baseline data has already been collected, saving the project 4 months
3. The additional benefit of $10k through using option B is far out-weighed by the saving of 4 months in collecting baseline data.
4. James can factor in having $15k less benefit from the project and it is still worthwhile.

Choosing the IPMVP option

Introduction:

- There are two options to chose from under PBA: option B and option C:

1. Option B: Retrofit isolation – all parameter measurement.
2. Option C: Whole facility.

Example - Choosing the IPMVP option - 1

Context:

- Anne is an AP. Her client has a project that can only be completed using annual creation. She is worried about future changes which may impact on the value of certificates she can create in future years. She wants to minimise the potential for this.

1. She can use option C.
2. She can use option B.

Example - Choosing the IPMVP option - 2

Actions:

- Anne decides to take the following approach

1. She decides to use option B to minimise the external influences to measurements – even though this will cost her an extra $2000 to install additional metering.
2. She decides to record some additional site constants which may allow her to exclude certain datasets.

Example - Choosing the IPMVP option - 3

Result:

- The extra money spent on using option B pays off:

1. In year 4, her client decides to run a more energy intensive production line.
2. If she had been using option C, this would have made it look like Anne's project had made negative savings.
3. Using option B means the more energy intensive process introduced by Anne's client is not relevant.

Setting the baseline period

Introduction:

- There are normally a large number of potential options to choose from when deciding on how long to measure the baseline for:

1. Cover an entire year – which covers any seasonal changes.
2. Cover a shorter period – but which still covers the full operating cycle of the energy consuming equipment.
3. Cover a shorter period – which may not quite cover the full operating cycle of the energy consuming equipment.
4. Shorter measurement periods may be limited by the effective range data requirements (see later slides).

Example - Setting the baseline period - 1

Context:

- Alan has an engineering workshop. He has a project which installs a VSD on his air compressor. He is unsure what baseline period to use

  1. He has data for the full year prior to the project as all of his compressors have had individual metering since then.
  2. Compressed air use at his workshop tends to vary on a weekly cycle which is fairly repeatable regardless of the season.

Example - Setting the baseline period - 2

Actions:

- Alan investigates a number of baseline periods:

1. The full year prior to the project.
2. The month prior to the project.
3. Each week of the two months prior to the project.

Example - Setting the baseline period - 3

Result:

- Alan decides to use the month immediately before the project:

1. The week 3 weeks prior to the project shows the greatest relative energy consumption, however the values of the independent variable are fairly limited in range during this week and Alan recognises that this limits the effective range.
2. The year immediately prior to the project shows a good reflection of energy consumption and an excellent range of the independent variable. However Alan does not believe it fully reflects the baseline due to a couple of metering anomalies earlier in the year.
3. The month immediately prior to the project has a good range of the independent variable and shows a greater relative energy consumption than the annual figure.

Minimising potential for future changes

Introduction:

- Undertaking an M&V PBA has a certain amount of risk for an AP, considering:

  1. measurement periods can be up to 10 years
  2. the energy consumer may change things during the measurement period – which could change expected results

Example - Minimising potential for future changes - 1

Context:

- Tom is an AP undertaking a lighting upgrade project at a shopping centre. Although he is using forward creation, he suspects that his client has plans to add additional lighting at certain places in the centre later on in the year.

1. Tom wants to minimise the chances of this change happening during the operating period measurement.

Example - Minimising potential for future changes - 2

Actions:

- Tom decides to use number of operating light fittings within the measurement boundary as one of his site constants

Example - Minimising potential for future changes - 3

Result:

- Tom's client does indeed install additional (more intensive) light fittings in the second last week of the operating period. Tom is not worried as:

1. The number of operating light fittings (site constant) changes during the measurement period, meaning that Tom can exclude the readings taken while those additional lights were switched on. Site constants which are not at their normal value must be excluded.
2. Tom's data still meets the requirements of the regulation which states that the operating energy model must be based on at least 80% of the total number of time intervals in the operating period.

Choosing the method of VEEC creation

Introduction:

- M&V projects can choose to create VEECs in different ways

1. Forward creation – where up to 10 years worth of certificates can be created following the measurement of the impact of the project.
2. Annual creation – where certificates can be created each year for up to 10 years after measurement each year.
3. Forward creation with annual top-up. A mixture of the above.

Example - Choosing the method of VEEC creation - 1

Context:

- Jane has a project upgrading a large steam boiler at her pharmaceuticals company. She is unsure whether to use:

1. Forward creation.
2. Annual creation.
3. Forward creation with annual top-up.

Example - Choosing the method of VEEC creation - 2

Actions:

- Jane decides to do some analysis of each option and finds:

1. The project is likely to give her around 24,000 certificates after one year of measurement, using an appropriate persistence model.
2. Annual creation is likely to give her 2,560 certificates per year over 10 years.
3. Annual creation will require 10 impact reports.
4. Forward creation with top up is likely to give her 24,000 certificates after one year of measurement, followed by 1,600 certificates after a report in year 10.
5. Forward creation with top up is likely to require 2* impact reports

*The second impact report must cover the entire 10 years.

Example - Choosing the method of VEEC creation - 3

Result:

- Jane decides to use forward creation as:

  1. She gets the vast majority of the certificates early on.
  2. She misses out on 1,600 certificates, but does not need to spend time and cost measuring for 10 years and supplying a second report covering all 10 years.

  Note: Cashflow considerations and timing of any audit before VEECs are registered.

Metering cost vs accuracy

Introduction:

- The measurement and verification method requires energy consumption to be measured. This means there is no calculation elements possible in the energy consumption data:
    1. For example you cannot measure in amps and do engineering calculations to work out kWh
    2. Nor can you measure in kWh for part of the time, then extrapolate to make up the remainder of the data within the measurement period.
- Measurement boundaries should therefore be carefully considered.
    1. Less resolution means measurement is likely to be cheaper, but less accurate.
    2. Measurement accuracy is but one factor of the relative precision of the overall calculation of certificates.

Example – Metering: Cost vs Accuracy - 1

Context:

- Will has a project which includes air compressors, vacuum pumps and cooling fans. He wants to optimise metering cost vs likely returns.

1. Each item of equipment is situated at a different physical location.
2. He has 4 air compressors have which have an existing kWh meter.
3. The 6 vacuum pumps each have ammeters and hours run meters but no kWh meter.
4. The 3 cooling fans each have current and voltage transformers which are linked to a SCADA system which only displays instantaneous kW readings.

Example – Metering: Cost vs Accuracy - 2

Actions:

- Will undertakes some analysis to work out what metering he would need if he decided to measure everything versus what the accuracy might be if he uses option C and measures at a whole facility level.

1. If using option C, the total of each ECM savings is likely to be around 10.5% of the baseline.
2. The metering for air compressors is suitable.
3. The metering for the cooling fans is suitable with some adjustments to the SCADA display to enable it to log kWh
4. The vacuum pumps can be measured at the vacuum pump distribution board which will require a single new kWh meter, costing $1,500.

Example – Metering: Cost vs Accuracy - 3

Result:

- Will decides to use option B and install a new meter at the vacuum pumps and ask his in-house engineer to programme the SCADA to log kWh.

1. With predicted savings only amounting to 10.5%, Will was worried that any changes to his prediction may lead to a whole facility measurement being unable to show clear savings over the rest of the ‘noise’ of general energy consumption – leading to poor relative precision or at worst a data set that was unable to clearly show any savings.
2. The cost impost of using option B was not too great considering he expected to save around $100,000 in energy and certificate benefit.
3. The time impost of measuring a baseline after meter installation was not great as the operating cycle of his site was only around one week.

Independent variables

Introduction:

- Independent variables are data that are independent from energy consumption but that influence it.

1. there may be a single independent variable
2. there may be multiple independent variables
3. or if you are using estimate of the mean – there may be no independent variable at all.

Example – independent variables - 1

Context:

- John is an AP undertaking a lighting project at a small shopping centre. He is unsure which independent variable(s) to use.

Example – independent variables - 2

Actions:

- John considers a number of options:

1. If his measurement boundary includes the HVAC system, he may use cooling degree days.
2. As one of the loading bays only operates 3 days per week, he may decide to use operational floor area.
3. He may use a combination of the above in a multi-variate regression analysis.
4. He may decide to use estimate of the mean and simply compare averages without using any independent variable.

Example – independent variables - 3

Result:

- John decides to use estimate of the mean and not use any independent variable for the following reasons.

1. His lighting circuits are all located in one distribution board and hence are easy to isolate and measure.
2. He discovered that his HVAC system has multiple set-points which vary in different seasons. This may make the logging of set-points and undertaking the regression analysis more complex and time consuming than he wants to make it.

Site constants

Introduction:

- Site constants are things that are not expected to change during the course of the measurement periods.

1. Site constants must be at their normal value for each measurement interval otherwise the other data collected during this interval (e.g. independent variables) will be ineligible.
2. At least one site constant must be listed in the M&V plan.
3. The M&V plan can be varied up until the first impact report is submitted.

Example – site constants- 1

Context:

- David is an AP undertaking a lighting project at an office building. He is unsure which site constants to use.

Example – site constants - 2

Actions:

- David considers a number of options:

1. Treated floor area
2. Net lettable area
3. Number of light fittings
4. Number of operational light fittings

Example – site constants - 3

Result:

- David decides to use net lettable area, but will also record all of the others for the following reasons.

1. The expectation is that this will not change during measurement periods.
2. He knows that depending on the data he gets, he may vary the M&V plan to change the site constants at a later date.

Forward creating up to 3 times

Introduction:

- It is possible to forward create up to 3 times for the same project.

1. The impact report can be resubmitted up to 2 times following approval of the first impact report.
2. This is used to refine the data in an application – for example if an AP has better data at a later date or if one of the ECMs will be completed later.
3. Subsequent reports will only be able to claim any certificates above the original application (previous applications will be considered ‘counted savings’).

Example – forward creating 3 times - 1

Context:

- Ash is an AP with a project that has 3 ECMs: air compressor upgrade; lighting upgrade and chiller upgrade.

1. The lighting upgrade is being completed first
2. The chiller upgrade will be completed 1 month afterwards
3. The air compressor upgrade will be completed another 2 months later.

Example – forward creating 3 times - 2

Actions:

- Ash assesses how best to get certificates as early as possible, without missing out on the full amount of certificates:

1. The lighting upgrade has a short operating measurement period of 1 week (ends 7 Jan 2019).
2. The air compressor upgrade has a 4 month operating measurement period (ends 1 August 2019)
3. The chiller has a 6 month operating measurement period (ends 1 August 2019).

Example – forward creating 3 times - 3

Result:

- Ash decides to submit an impact report in early January.
  1. This only contains the savings from the lighting project.
- Ash then submits a further impact report in late August.
  1. This covers all 3 ECMs.
  2. The only limiting factor is the 10 year maximum which starts from when the lighting project was implemented.
  3. Ash may decide to submit a further impact report if she gets data that shows more accurate data (for example if the 6 month operating period for the chillers limited the effective range).

Sampling

Introduction:

- Although there is a requirement for all energy consumption to be ‘measured’, it is possible to undertake sampling in some cases.

1. The items sampled must be identical.
2. The operating conditions of the items sampled must be identical.
3. Advisable to discuss with us first.
4. M&V plan should explicitly state what is being sampled and give adequate justification.
5. Impact reports should provide suitable evidence showing identical items/conditions.

Example – sampling - 1

Context:

- Sally has a lighting upgrade project. The project involves upgrading light fixtures including in 25 individual offices, each of which is distributed throughout various areas of an office block.

1. The lighting circuits are in numerous places throughout the building.
2. All lights are automatically switched on at 6am and off again at 9pm.
3. 12 of the offices have an identical layout and have identical light fixtures.
4. Another 8 offices have an identical layout and have identical light fixtures.
5. The remaining 5 offices will have light fittings which include occupancy sensors installed, but are otherwise identical to each other.

Example – sampling - 2

Actions:

- Sally wants to spend as little on measurement as possible, so decides to investigate using sampling. She measures:

  1. One of the 12 offices
  2. One of the 8 offices
  3. One of the 5 offices – with all 5 offices having had their new occupancy sensors disabled (with the lights reverting to the automatic time switch).

*Note if there were occupancy sensors in the baseline period, she would need to measure without disabling these.

Example – sampling - 3

Result:

- Sally greatly cuts down on the number of measurements.

1. She supplies the commission evidence showing that each ‘like’ office is identical (plan drawings), along with the operation schedule of the automated time controls.
2. She is prepared to ‘lose’ any benefit associated with the occupancy sensors in favour of easier and shorter measurement (not disabling these sensors would mean each of the 5 offices would likely need to be individually measured over a more significant time period – ideally a full year).

ESSENTIAL SERVICES COMMISSION

Example decision points

Reporting considerations

Decision points covered – Reporting considerations

Reporting considerations

- Interactive effects
- Decay factors – what to use
- Consideration of the effective range
- Fitting your statistical model
- Regression analysis or Estimate of mean?
- Selection of the normal year
- Relative precision and accuracy factor
- Counted savings
- Variations

Interactive effects

Introduction:

- Interactive effects are any energy effects, caused by the project, which occur beyond the measurement boundary.

  1. For example undertaking a project to upgrade lighting reduces the heat load caused by operation of lighting, so HVAC systems can be affected.

Example – interactive effects - 1

Context:

- Ed is replacing a gas-fired steam boiler for a more efficient version.

1. Gas savings are predicted to amount to around 10000 GJ per year.
2. The new boiler installation causes the feedwater circulation pumps to work harder than they did previously.

Example – interactive effects - 2

Actions:

- Ed does not want to have to measure the energy consumption of these pumps before and after the upgrade.
- He undertakes some analysis and calculations which show:

1. Ed calculates that the expected increase in electricity consumption due to the increase in pump activity is around 40 MWh per year.

Example – interactive effects - 3

Result:

- Ed does not need to measure the electrical items and can treat them as interactive effects.

1. The 40 MWh/y translates to 144 GJ/y which is less than 1.5% of the 10,000 GJ/y expected to be saved in gas consumption.
2. Ed must include this information and all estimates, justification, calculations and evidence in his M&V plan.
3. When calculating VEECs, Ed should reduce his GHG savings by the appropriate amount.

Decay factors

Introduction:

- When using forward creation or forward creation with ‘top-up’, decay factors must be used to predict the decay in savings over time.

1. This can be done using the default decay factors as described in the methods & variables document.
2. This can be done using an approved persistence model (such as the model included in the OEH tool).
3. You can apply to the commission to have a persistence model approved (this will need to include robust data showing justification and evidence for the model).
4. Where there are two equally valid models applicable – the most conservative model should be used.
5. Where multiple ECMs are included within one measurement boundary, the most conservative model should be used, unless one measure is much more significant than the others – in which case, this model can be used.

Example – decay factors - 1

Context:

- Dave has multiple ECMs, including installing VSDs in fans, installing low friction conveyor belts, installing a cogeneration plant, and a lighting upgrade.

  1. Dave is using option C – whole facility, and wants to know which persistence model he should use.

Example – decay factors - 2

Actions:

- Dave undertakes an assessment and finds:

1. The ECM with the ‘best’ model is the lighting upgrade, which gives a full 10 years in total and gives 10% of the savings.
2. The ECM with the most conservative model is the low friction belt upgrade, which gives 1.95 years in total and forms 2% of the savings.
3. The cogeneration plant upgrade comprises 80% of the savings and gives 9.55 years in total.

Example – decay factors - 3

Result:

- Dave contacts the commission to discuss which model he should use. He agrees the following:

1. It would be too expensive (and time consuming) to use option B and separate out each ECM so that individual models could be used for each ECM.
2. In this instance it would be unfair to use the most conservative model of 1.95 years for all ECMs
3. Likewise, it would be inappropriate to use the ‘best’ model of 10 years.
4. The most appropriate model in this instance is the cogeneration model, which gives 9.55 years.

Effective range

Introduction:

- Effective range is the range of values of the independent variable used to develop:

1. The baseline model – for annual creation
2. BOTH the baseline model AND the operating model – for forward creation
    - This means the range of data that is found in the baseline and the operating models together (to clarify - if data only appears in one of those models, it is outside the effective range).

Example – effective range - 1

Context:

- Emma has a project which improves the efficiency of a spray drier. She plans to forward create her certificates.

1. She wants to know what the effective range is for her project.
2. The independent variable for this project is kg of throughput.

Example – effective range - 2

Actions:

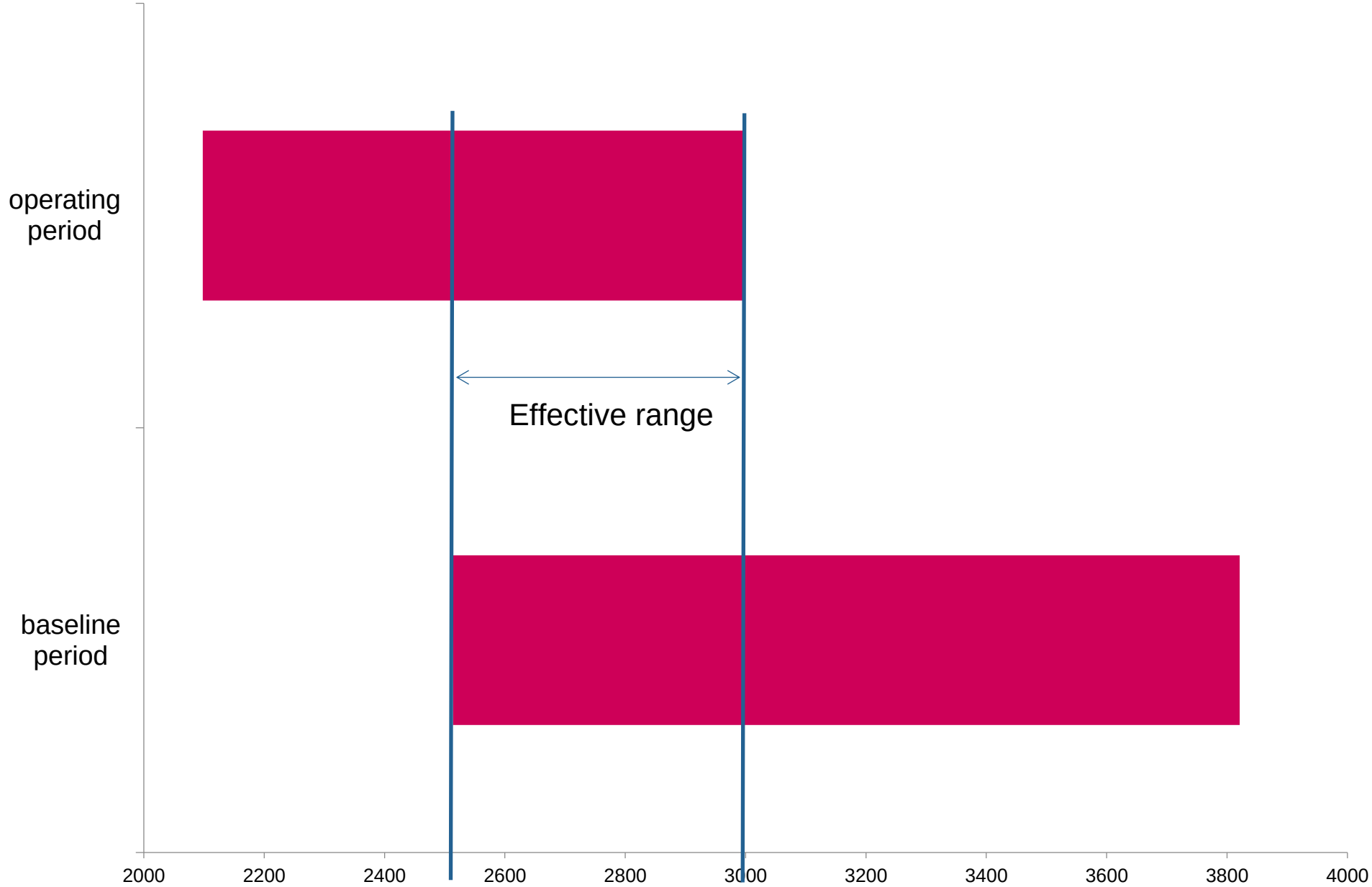
- Emma's data is as follows:

  1. The baseline throughput ranges from 2,514 – 3,821 kg.
  2. The operating period throughput ranges from 2,098 – 2,998 kg.

Example – effective range - 3

Result:

- Emma's effective range is:
  1. 2,514 – 2,998 kg.
  2. The range from 2,098 – 2,513 kg sits outside as it is not included in the baseline period.
  3. The range 2,999 – 3,821 kg sits outside this as it is not included in the operating period.
- The range of data she can actually use (eligible data) is 5% of the difference between max/min either side of this, which is:
  1. This is +-24.2 kg so: 2,489.8 kg to 3,022.2 kg. Any data that sits outside this is not eligible.


operating period
Effective range
baseline period
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000

ESSENTIAL SERVICES COMMISSION

Q&A?

Resume after lunch

Statistical model

Introduction:

- For data to be eligible it must meet certain requirements (eg site constants must be at their normal values).
- For models to be eligible, certain statistical validity checks must be done.

1. R^2
2. Coefficient of Variation
3. Independent variable sensitivity t-statistic
4. Bias error

- For models, there are no strict criteria these have to meet, but the AM&VP should be convinced that the model is valid (sign-off: IPMVP compliant).

1. For estimate of the mean, the Coefficient of variation of measured energy consumption MUST be less than 15%.

Example – statistical model - 1

Context:

- Bob has undertaken some regression analysis on his VSD installation project at the sawmill. He undertakes the statistical tests.

1. Most statistical tests give very good results, showing valid data.
2. The r^2 value of his baseline model is 0.69. This is below the standard indicated in IPMVP.

Example – statistical model - 2

Actions:

- Bob recognises that the r^2 value is not ideal. He can choose to:

1. Use a different modelling method – i.e. estimate of the mean.
2. Use a different measurement period (if he has the data) = variation.
3. Consider using different independent variables = variation.
4. Consider using a different functional form of regression (e.g. other than linear regression).
5. If he believes the data is still valid, and can justify reasoning to the AM&VP, he can choose to stick with the existing data set and convince the AM&VP to sign-off on this model.

Example – statistical model - 3

Result:

- Bob believes the model is representative of actual conditions. Other statistical tests are positive. He chooses to convince the AM&VP of the validity of the data as:

1. He recognises that r^2 is not an infallible method of assessing the validity of a model.
2. Other tests show good correlation.
3. If an AM&VP signs off on the impact report (which contains this model), then the commission are highly likely to also accept this.
4. If an AM&VP does not accept this, then he can choose another way to deal with this.

Regression analysis or estimate of the mean

Introduction:

- There are two methods of modelling allowable. Regressions analysis or estimate of the mean.

1. Regression is a form of analysis used to explore which of the independent variables are related to the dependent variable (energy).
2. A number of statistical tests must be done for regression to check data validity.
3. Estimate of the mean is a simpler form of analysis which does not rely on an independent variable.
4. Estimate of the mean only has one validity test: CV of the measured energy consumption <15%.
5. However, estimate of the mean has a ‘penalty’ in the accuracy factor table as this is deemed to be not as accurate as regression.

Example – regression or estimate of mean - 1

Context:

- James wants to use regression analysis for his project with multiple ECMs.

1. Regression is more accurate, so should better reflect the savings achieved by the project.
2. Regression accuracy factors are better than estimate of the mean:

Table 1 – Accuracy factor

Relative precision	Accuracy factor if an energy model for the project is developed using an estimate of the mean	Accuracy factor if all energy models for the project are developed using regression analysis
< 25%	0.9	1
25% to < 50%	0.8	0.9
50% to < 75%	0.7	0.8
75% to < 100%	0.5	0.6
100% to < 150%	0.3	0.4
150% to < 200%	0.1	0.2
>=200%	0	0

Example – regression or estimate of mean - 2

Actions:

- James records all necessary data and undertakes his modelling and statistical tests:

  1. The statistical tests show the model is a poor reflection of the data

- James tries using different independent variables and different regression trends (such as logarithmic or exponential) and using a different measurement period:

  1. The results are similar and the model does not show much improvement.

Example – regression or estimate of mean - 3

Result:

- Instead of remeasuring further data, James decides to use estimate of the mean instead of regression.

1. The Coefficient of variation meets the <15% rule
2. The accuracy factor is 0.9 instead of 1 for James' project.

Normal year

Introduction:

- When using forward creation, a normal year must be used.
- A normal year is a set of values of the independent variable for a 12 month period. A number of options are available for normal year.

1. The normal year can be the baseline, the operating period, or any other fixed period (although you should consider the effective range).
2. Gave examples on a chart at beginning of presentation.

Example – normal year - 1

Context:

- Alan VSD installation project at his engineering workshop has completed. He is using forward creation and wants to pick the best normal year.

Example – normal year - 2

Actions:

- Alan undertakes an assessment to find out which might offer the most accurate result:

1. He can choose to normalise to the baseline period.
2. He can normalise to the operating period
3. He can choose another fixed period and normalise both baseline and operating period to this.

Example – normal year - 3

Result:

- Alan chooses to normalise to some fixed conditions which fairly account for what ordinarily happens in a normal year.

1. The baseline had some conditions which were not considered part of normal operations.
2. If Alan had used the operating period, there would have been some restrictions relating to the effective range.
3. Using fixed conditions allowed Alan to fairly account for what a normal year of operation looks like.

Relative precision/accuracy factor

Introduction:

- The accuracy factor is a factor applied to the result of abatement calculations. It is related to the relative precision of the project.

1. Relative precision accounts for a number of things, including metering accuracy, modelling error, sampling error, and suchlike.

Table 1 – Accuracy factor

Relative precision	Accuracy factor if an energy model for the project is developed using an estimate of the mean	Accuracy factor if all energy models for the project are developed using regression analysis
< 25%	0.9	1
25% to < 50%	0.8	0.9
50% to < 75%	0.7	0.8
75% to < 100%	0.5	0.6
100% to < 150%	0.3	0.4
150% to < 200%	0.1	0.2
>=200%	0	0

Example – relative precision/accuracy factor - 1

Context:

- For Tom’s lighting upgrade project at the shopping centre, he realises that his operating model – using regression analysis is not ideal and is unsure what the best way forward is.

Example – relative precision/accuracy factor - 2

Actions:

- Tom considers the following:

  1. The relative precision using regression analysis is 30%
  2. The relative precision using estimate of the mean is 22%

Example – relative precision/accuracy factor - 3

Result:

- Tom decides to use estimate of the mean:

1. Both methods effectively have the same accuracy factor of 0.9 on Table 1
2. Estimate of the mean is easier
3. It has fewer evidentiary requirements
4. He needs to keep fewer records
5. AM&VP and commission assessments are therefore likely to be easier/quicker.
6. Any future audits are likely to be easier/quicker

Counted savings

Introduction:

- Counted savings are used to account for savings made in previous years, abatement made in other prescribed GHG schemes, or any other savings unrelated to the project.

Example – counted savings - 1

Context:

- Anne's client for her annual creation project decides to do some further energy efficiency upgrades in year 5 of her project.

1. These additional activities occur within Anne's measurement boundary.
2. These activities will make Anne's project look better than it should look.
3. Anne is unsure how she should deal with this.

Example – counted savings - 2

Actions:

- Anne calls the commission to discuss, this issue. The discussion includes:

1. Whether or not a variation may be possible to include those activities as part of Anne's project. This is not possible as the activity is of a different type to Anne's original project purpose.
2. What measurement equipment is available to measure the additional equipment.
3. What specifications and other data is available on the new equipment.
4. Whether or not Anne wants to start a new project that includes the new upgrades.

Example – counted savings - 3

Result:

- Anne uses counted savings to exclude the new activities.

1. Even though there is additional abatement, Anne cannot claim this under her existing project, as the activity is of a different type.
2. Anne feels that the additional activity is too small for her to bother submitting a new project.
3. There is no additional measurement equipment installed for the new upgrades, but the scale of savings is relatively small compared to Anne's project.
4. Anne uses technical specifications, operating data and engineering calculations to work out savings from the additional activities.

Variations

Introduction:

- In the real world, project plans change all the time. Variations are available to account for most of these changes

1. There are some things which cannot be varied, such as the location of the project (different site address), or the purpose of the project.
2. An approval to vary form should be submitted to the commission where variations occur.

Example – variations - 1

Context:

- After completion of Jane's boiler upgrade project at the pharmaceuticals plant. Modelling of the operating period is relatively reasonable, but could be made better as there is one week which has unusual, outlying data.

Example – variations - 2

Actions:

- Jane undertakes some analysis and discovers:

  1. The anomaly causing the outlier is caused by a defective steam trap.

Example – variations - 3

Result:

- Jane decides to submit a variation to vary her M&V plan, where she adds in a new site constant.

1. The new site constant is number of operational steam traps.
2. This means that the period during which the steam trap was defective, the site constant was not at its normal value
3. This means that data for that period can be excluded from her analysis, meaning her operating model was much more accurate.

ESSENTIAL SERVICES COMMISSION

M&V - Hot tips

M&V - Hot tips

Hot tips

- What if something changes – NRA's?
- Selection of the AM&VP
- Significant digits
- Renewables – how to deal with future

Non-routine adjustments

Introduction:

- NRA's are adjustments made to the baseline in order to account for unexpected changes that happen in the real world
  1. IPMVP allows these
  2. PBA does NOT allow NRAs
- There are some techniques you can use to mitigate this
  1. Use as tight a measurement boundary as possible
  2. Use additional site constants to exclude data periods
  3. Use forward creation (allowing you to normalise to a different period)

Selection of the AM&VP

Introduction:

- AM&VPs will be rated by the commission based upon their performance (risk-based)

1. The risk rating of the AM&VP you choose to use will have a direct relationship to the risk of your project – and hence will be a large determinant of whether you are audited and/or what level of audit you may receive.
2. We will be publishing a ‘league table’ of AM&VPs once we have enough data (may not be for some time)
3. At the moment all AM&VPs are equal.

Significant digits

Introduction:

- When undertaking calculations use standard significant digit rules. These are included in IPMVP

1. Only report accuracy to that of the least accurate measurement device
2. Do rounding at the end
3. Decimal points are important to keep included where necessary. For example:

Reporting the number ‘5000’ to 4 significant digits, it should read: 5000. and not 5000 or 5000.0

Reporting the same number to 6 digits, it should read: 5000.00

Renewables and export

Introduction:

- PBA M&V projects CAN include renewables such as solar PV, and these can forward create certificates. However there are some rules:

1. No export outside measurement boundary at any time
2. No double-dipping with other prescribed GHG schemes
3. Can participate in other schemes at the same time, but abatement must be separately measured and apportioned between schemes.

ESSENTIAL SERVICES COMMISSION

Benchmark rating - Update

Benchmark rating - update

Introduction:

- DELWP are currently developing the benchmark rating method.

1. This is likely to be similar to the aggregated baseline method in ESS in NSW.
2. This is likely to make use of the NABERS methods, which has methods for environments such as:
   - Office
   - Shopping centre
   - Data centre
3. This is a workshop, so we are interested in your feedback…

Benchmark rating - feedback

What works well / does not work well in other jurisdictions:

- Please comment on experience you may have had in other jurisdictions, or comments you have heard from others operating in other jurisdictions.
- We may be able to build improvements into our administration.

1. Barriers
2. Complexities
3. Unnecessary administration
4. Comment on why uptake hasn’t been as much as it could have
5. What works well

ESSENTIAL SERVICES COMMISSION

Q&A

ESSENTIAL SERVICES COMMISSION

1-1 sessions

Time permitting

1-1 Sessions

Use Sli.do to indicate a desire for a 1-1 session:

- Login to Sli.do and:

1. Submit a question asking for a 1-1 PBA discussion
2. Please include your name, company and phone number in the question.
3. If we run out of time today, I will call you next week for a telephone discussion.
4. If you don’t have time today, please indicate if you’d like me to call you next week.

Could everyone else please move into the foyer

Thank you for your time

Victorian Energy Upgrades

The Department of Environment, Land, Water and Planning develops policy for the Victorian Energy Upgrades program.

We administer the program as the ‘Victorian Energy Efficiency Target scheme’ under the *Victorian Energy Efficiency Target Act 2007*.

For more information, visit **veet.vic.gov.au**.

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