Energy Security Safeguard
Office of Energy and Climate Change

# Energy Savings Scheme

## 2022 Rule Change

### Public Consultation Forum
### NRE-A Requirements discussion

October 2022

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# Acknowledgement of Country

We acknowledge that today we meet on many Aboriginal lands.

We acknowledge the traditional custodians of the lands and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work.

*Nikita Ridgeway*

# Agenda

| | | |
|---|---|---|
| 15.30 | Introduction and background | Ahmed Alabadla |
| 15:50 | NRE-A Requirements | Tristan Anderson |
| 16:10 | NRE-A Example (video) | Bruce Rowse |
| 16:30 | Q&A | Tristan Anderson<br>Ahmed Alabadla |
| 17:00 | Session closes | |

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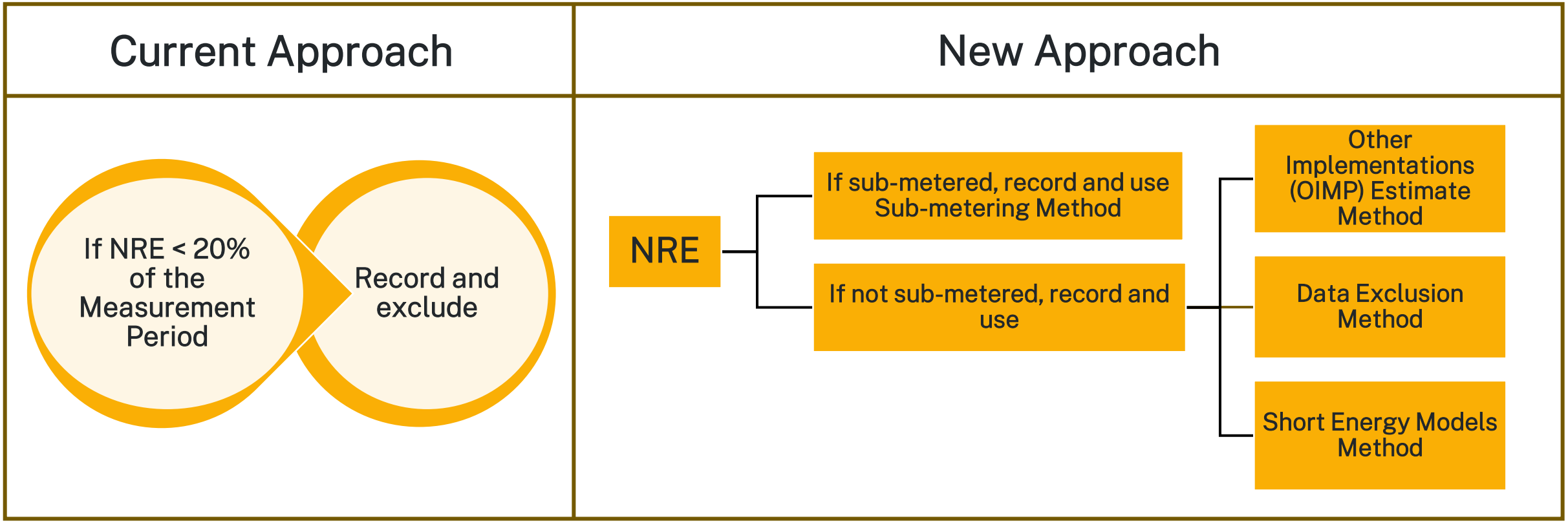
# NRE-A Requirements

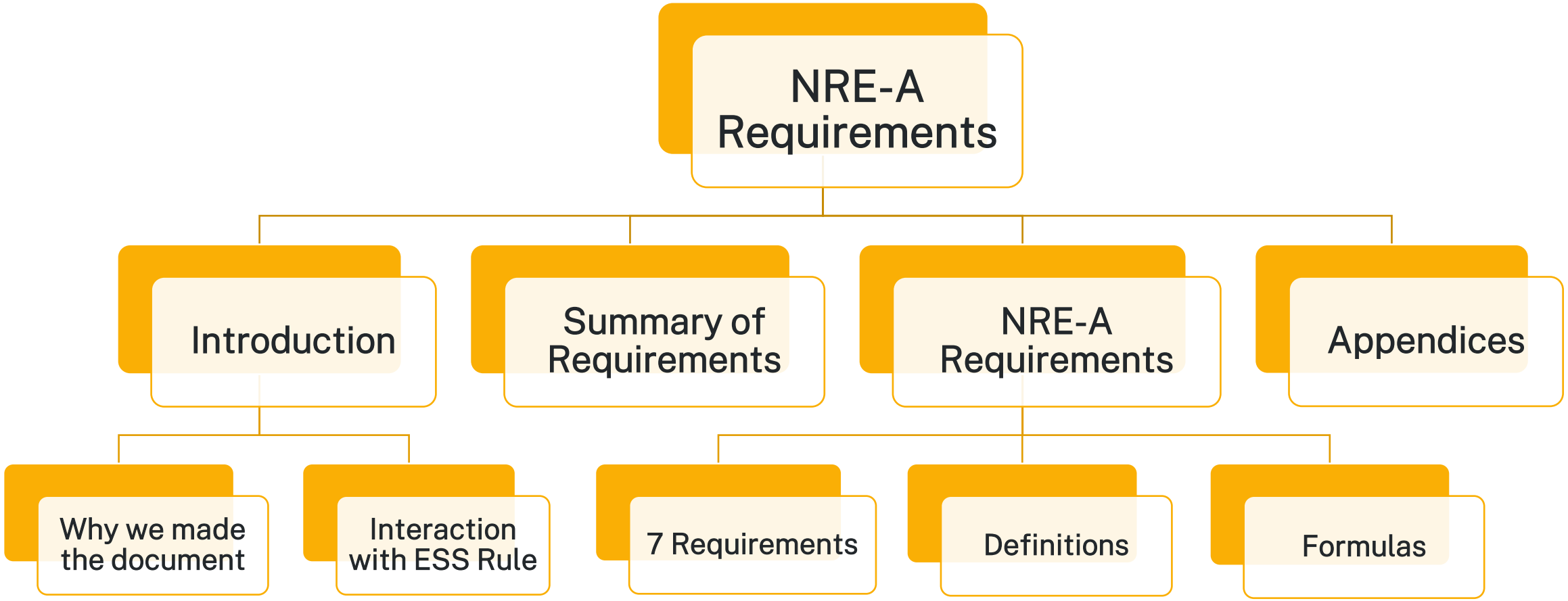
## PIAM&V Rule change

# PIAM&V Rule change

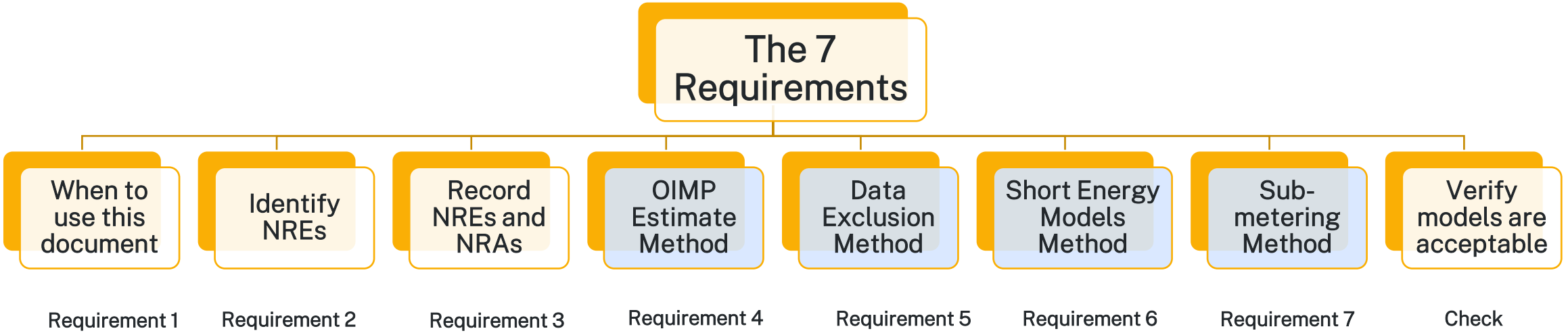
## Summary of Rule change

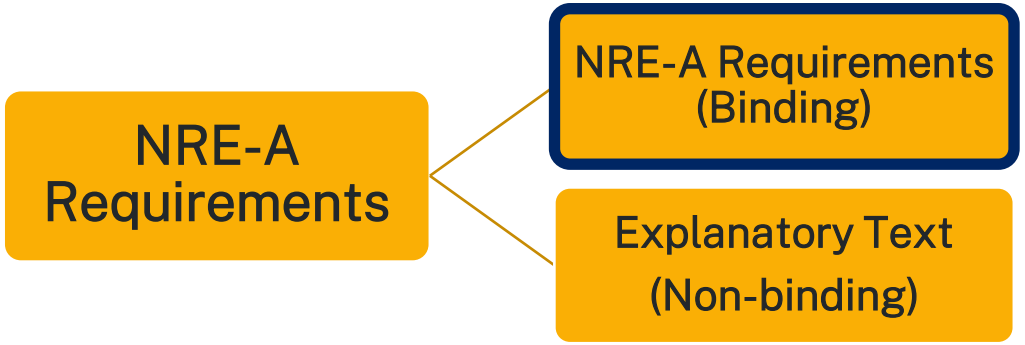


# NRE-A Requirements outline



# NRE-A Requirements outline



# NRE-A Requirements feedback

## OECC response to NRE-A Requirements targeted consultation

Stakeholders feedback:

- Independent Variables may routinely fall outside the Effective Range and should not constitute Non-Routine Events (noting that the Independent Variables are used to make ‘routine adjustments’)

We responded by:

- Amending the definition of what constitutes an NRE (Requirement 2.1)

# NRE-A Requirements feedback

## OECC response to NRE-A Requirements targeted consultation

Stakeholders feedback:

- As part of Requirement 6, the discount factor of 3.5 used in calculating the Effective Range Adjustment Factor (ERAF) was too high and should be reduced

We responded by:

- Reducing the discount factor in the ERAF calculation from 3.5 to 3.0

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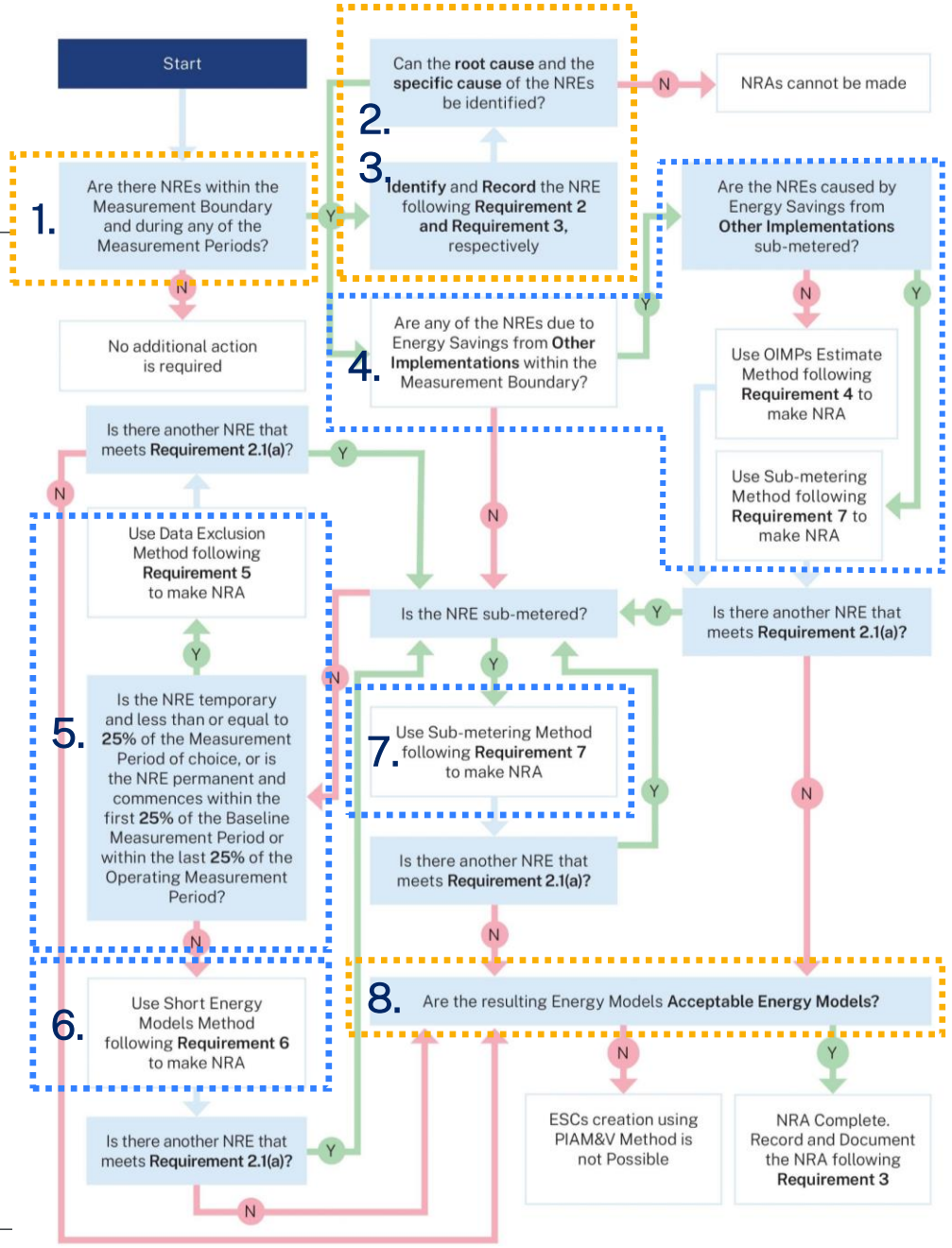
# Summary of the Document

## NRE-A Requirements

# Summary of Requirements

## NRE-A Requirements - Overview

1. When to use: If there has been an NRE
2. Identify NREs:
   - Events affecting energy consumption that aren't modelled
   - Other Implementations (OIMPs)
3. Record the NRE root cause and specific cause
4. Account for OIMPs using the OIMPs Estimate Method
5. Apply the Data Exclusion Method if permissible
6. Apply the Short Energy Models Method if permissible
7. Apply the Sub-metering Method
8. Verify if models are acceptable



# Requirement 1
# When to use the requirements

## When an NRE occurs:

- ACPs must comply with the Requirements under clauses 7A.5B and 7A.5B1 of the ESS Rule
- It is permissible to wait until the impacts of the NRE on energy consumption end, using Measurement Periods outside the NRE-impacted period
- Multiple NREs can be adjusted for
- The Independent Variables in both the Baseline and Operating Energy Models must be identical
- The NRA methods are applicable to:
  - Regression Analysis
  - Estimate of the Mean
- The NRA are not applicable to:
  - Computer Simulation
  - Sampling Method

# Requirement 2
# Identify NREs

## NREs are due to events that affect energy consumption and aren't modelled, or due to OIMPs

- Not modelled by
  - Independent Variables, or
  - Site Constants
- NRE may be a Permanent or Temporary NRE
- A Permanent NRE is one which is
  - continuous, and
  - persists after the Measurement Period for the Operating Energy Model has elapsed
- ACPs need to
  - establish if the NRE is permanent or temporary
  - identify the root cause and specific cause
  - if any measurement period occurs during COVID, provide evidence of whether COVID has caused NREs and define the COVID impacted period

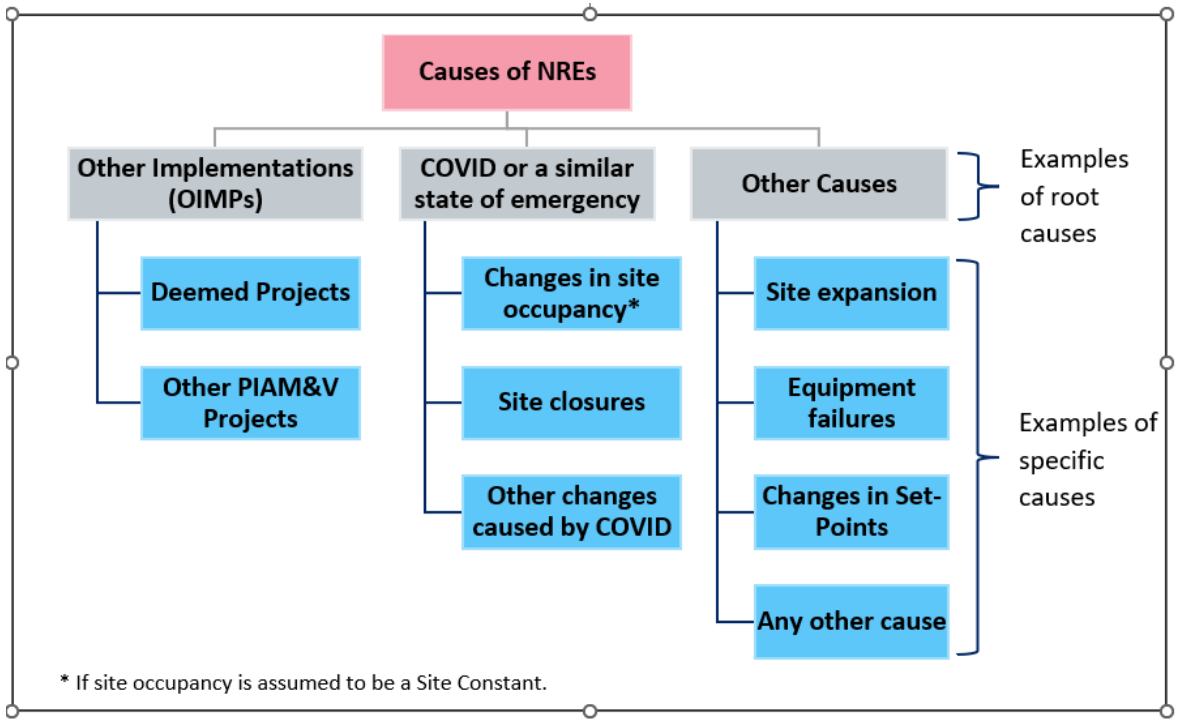



*Figure 2: Examples of NRE root causes and specific causes.*

# Requirement 3
# Record NREs and NRAs

## In accordance with Requirement 3

- Record-keeping requirements exist when:
  - Developing Baseline and Operating Energy Models
  - Using the OIMPs Estimate Method
  - Using the Sub-metering Method

**Requirement 3**

3.1 In accordance with clause 7A.5B1, an ACP must record NREs that were identified according to Requirement 2.

3.2 An ACP must keep records of the following when determining the Baseline and Operating Energy Model:

(a) All Independent Variables and all Site Constants.
(b) Whether or not any NREs occurred during any of the Measurement Periods and the Implementation Period.
(c) A list of Site Constants that changed, and the reason for these changes.
(d) For each NRE occurring during any of the Measurement Periods and the Implementation Period:
  (i) The root cause of the NRE.
  (ii) The nature of the NRE as being temporary or permanent.
  (iii) Dates when an NRE impacted the relevant Measurement Period.
  (iv) Calculations supporting the NRA methods performed during the Baseline and the Operating Energy Model Measurement Period.
(e) For each NRE occurring during any of Measurement Periods and the Implementation Period, records of eligible documentary evidence of the NRE's specific causes. These include:
  (i) payment invoices or operational records;
  (ii) internal memos or data from the company website;
  (iii) public health orders relevant to the facility type;
  (iv) photograph evidence; or
  (v) data from SCADA or BMS logs.

3.3 When using the OIMPs Estimate Method, an ACP must keep the following records:

(a) The Implementation Date(s) of OIMP(s).
(b) The number of ESCs created for the OIMPs.
(c) The date of ESCs registration.

3.4 If the Sub-metering Method is used, an ACP must keep the following records:

(a) A diagram showing the PIAM&V Measurement Boundary and the sub-meter boundary.
(b) Specification of the sub-meter(s) used.
(c) Sub-meter raw data.
(d) Independent Variable raw data, where equipment is added or removed with a consequent change in an Independent Variable which is a direct or an indirect output of the equipment.
(e) A list of Observations excluded from any Measurement Period due to missing sub-meter data.
(f) For installing on-site generation, the certificate showing the connection date of the onsite generation.

# Requirement 4
# OIMPs Estimate Method

## Other Implementations

- Applies where the other Implementation is not sub-metered
- The ESCs for OIMPs must have been created and registered
- For the purposes of top-up after the end of the Operating Energy Model Measurement Period, the Sub-metering Method is the only way to account for future OIMPs
- Following the OIMP Estimate method, energy savings are determined as follows:
    1. Determine the average annual Energy Savings from the OIMP
    2. Adjust the savings with the relevant OIMP Adjustment Factor (OAF)
    3. Determine the average adjusted OIMP Energy Savings per observation
    4. Add the adjusted OIMP Energy Savings per Observation to energy consumption for each interval in the Baseline and Operating Energy Models in which the OIMP is present
    5. Establish the Baseline and Operating Energy Models and determine savings
    6. Adjust the Relative Precision of the Estimated Energy Savings

# Requirement 5
# Data Exclusion Method

## Allows up to 25% of data points in a Measurement Period to be excluded

- For permanent NREs, limitations are imposed on the data that can be excluded to enable a like-for-like comparison
- Multiple NREs can be accounted for, but the maximum permissible total data exclusion is 25%
- Data Exclusion Method cannot be used to account for OIMPs

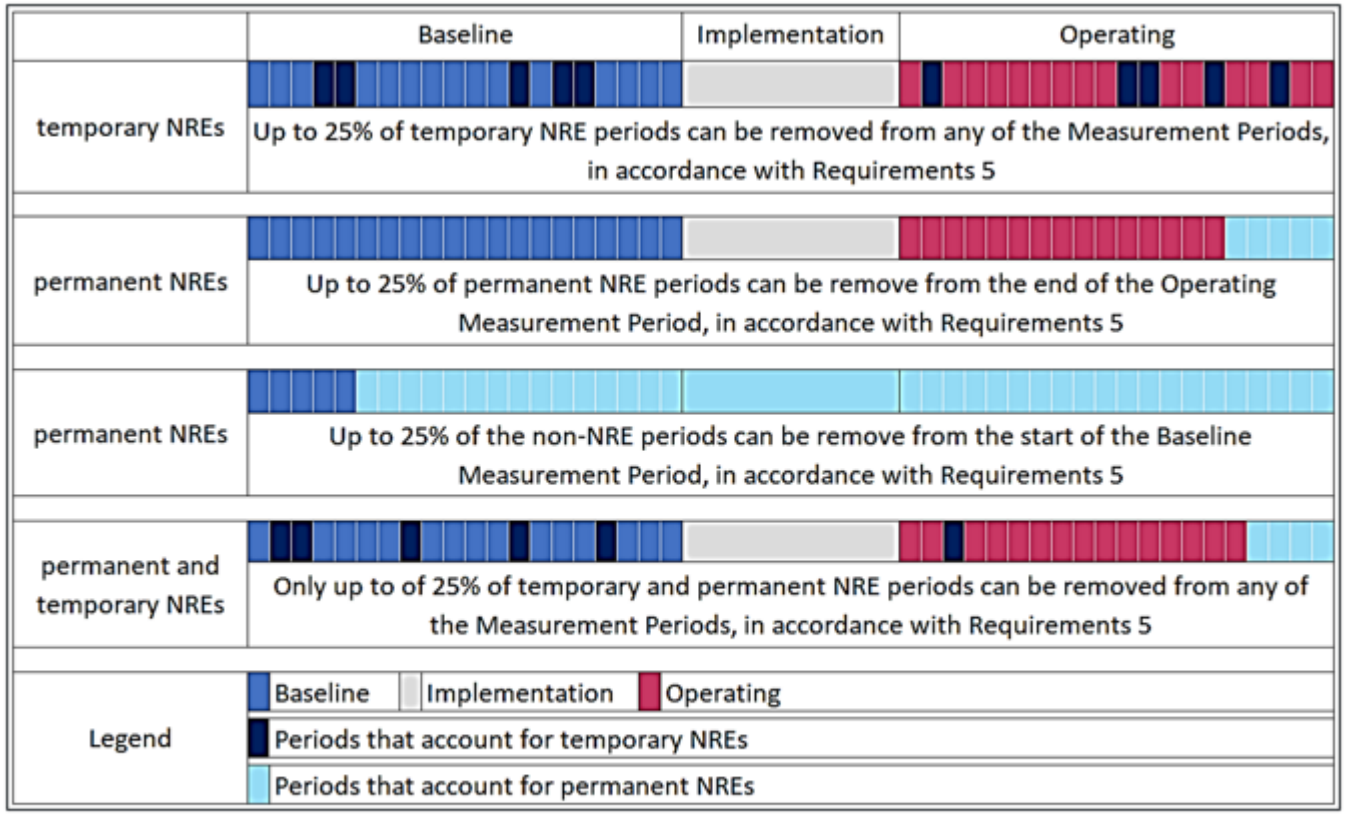



*Figure 3: Illustration of the Data Exclusion Method. Each cell of the Baseline and Operating Energy Models' Measurement Periods represents 5%.*

# Requirement 6
# Short Energy Models Method

## Used when the NRE affects more than 25% of the Measurement Period

- The Short Energy Models Method cannot be used to account for OIMPs
- The number of observations must be at least 4 times the number of IVs in any measurement period
- Short models must contain less than 75% of a Full Operating Cycle's worth of data
- The range of Independent Variables in the Baseline and Operating Energy Models must be similar
- The length of the Measurement Period of the Energy Model with the least number of Observations must be at least 75% the length of the period with the most Observations
- An Eligible Range Adjustment Factor may be used

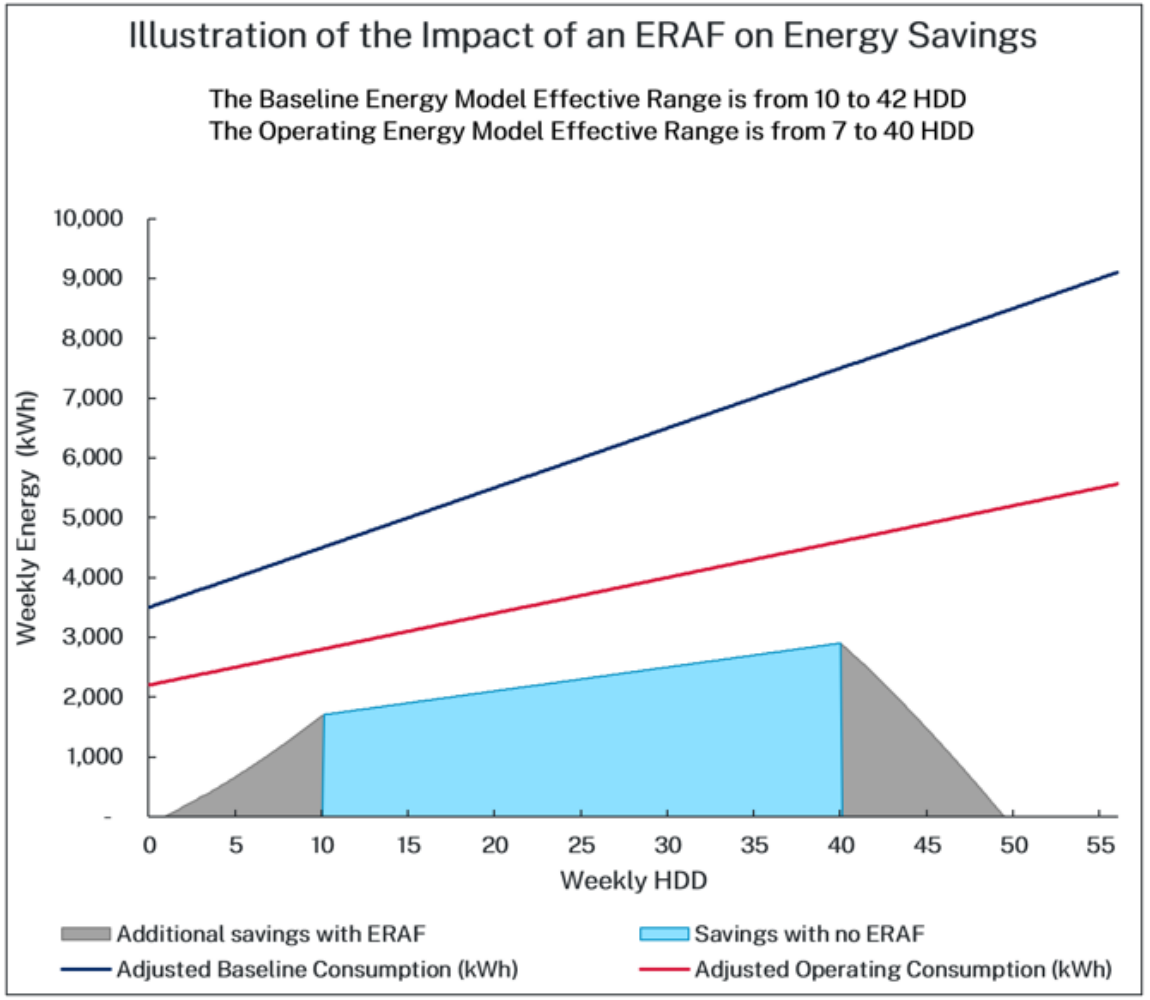



*Figure 5: Illustration of the ERAF impact on the Normal Year Energy Savings calculation.*

# Requirement 7
# Sub-metering Method

## Sub-metering Method

- Restricted to the addition or removal of equipment, onsite generation, and OIMPs with sub-metering
- Requirements to enable a like-for-like comparison:
  - Only applies to observations where the NRE is present
  - Sub-metering measurements must be undertaken for each Observation
  - Alignment and synchronization of time clocks
  - Missing data for any observation - maximum allowable is 2% of each Observation
  - Sub-metering also applies to Independent Variables

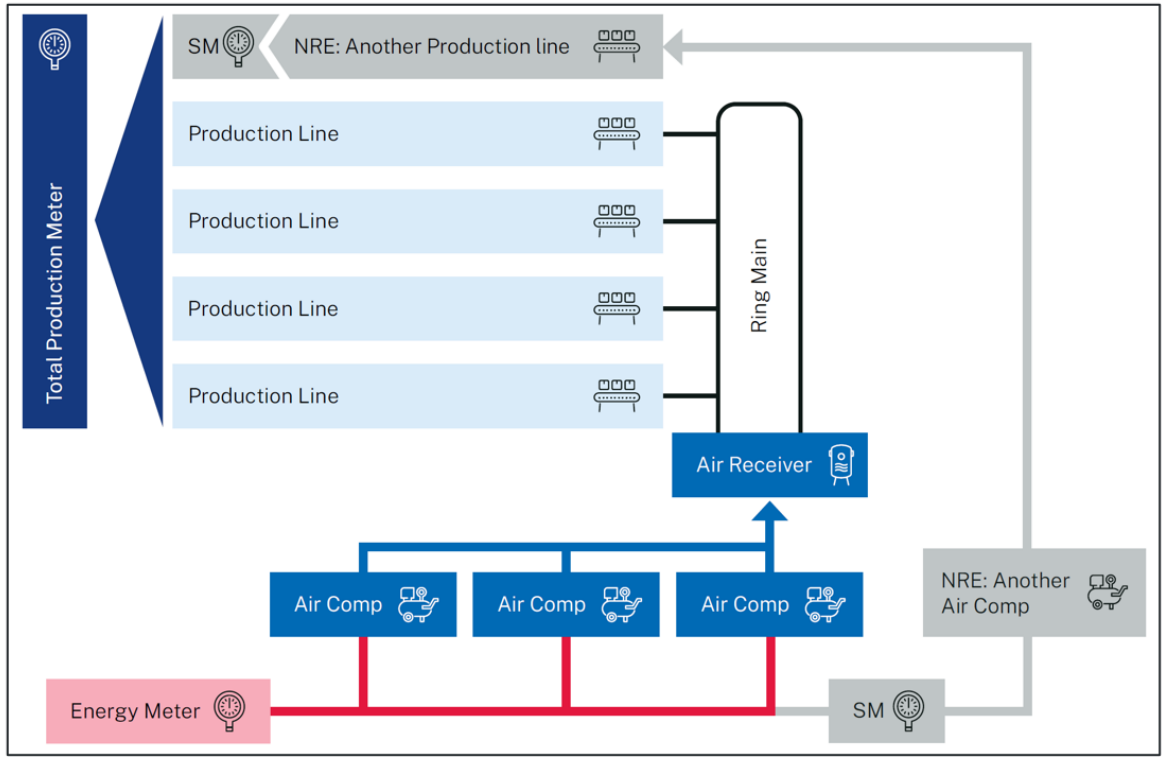



*Figure 9: An illustration of the CAS after the addition of new equipment (NRE), with sub-metering installed to undertake the NRA using the Sub-metering Method.*

# Resulting energy models must be acceptable

## Acceptable Energy Model

- Meets the minimum statistical requirements in accordance with Table A22 in Schedule A
- Mandatory minimum statistical requirements
  - T-stat > 2
  - If $R^2$ is above 0.5, then $CV_{RMSE}$ must be less than 0.2
  - If $R^2$ is below 0.5, then $CV_{RMSE}$ must be less than 0.1

| Modelling Criteria | Requirement |
|---|---|
| T-statistic of Independent Variable | Absolute Value > 2 |
| Adjusted $R^2$ (Adjusted Coefficient of Determination) | $CV_{RMSE} < 0.2$ for $R^2 > 0.5$<br>$CV_{RMSE} < 0.1$ for $R^2 < 0.5$ |
| Coefficient of Variation of the Root Mean Square Error ($CV_{RMSE}$) | |

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# NRE-A Requirements Example

Video presented by Bruce Rowse

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# Thank you

Any questions? Slido #NREA