Australian EEO experiences incorporating innovative M&V methodologies

IEA, Modernising energy efficiency obligation programmes

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Overview

1. Why M&V methods
2. Australian M&V methods
3. Challenges and opportunities

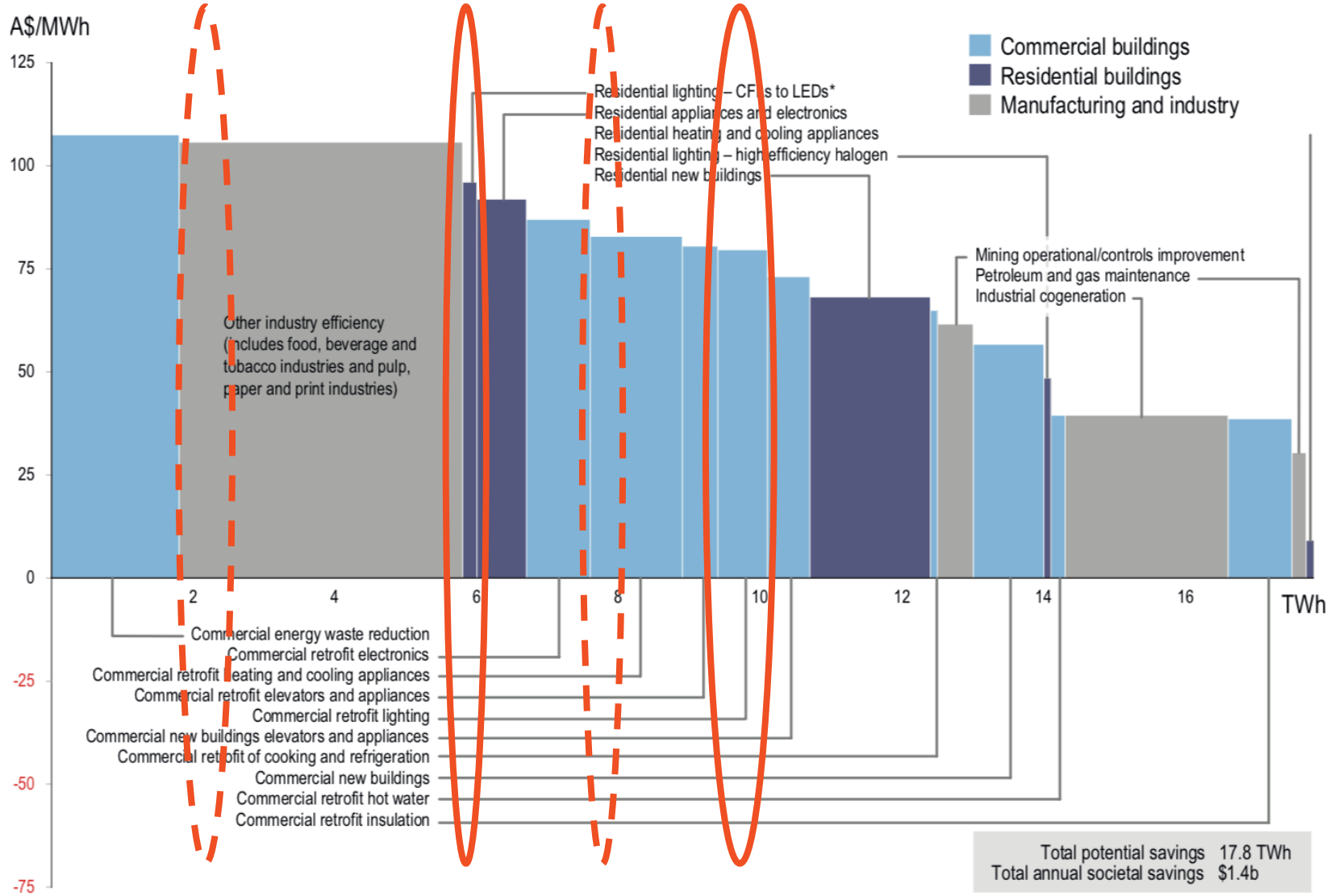
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Why did we introduce M&V methods

Other methods only reaching a fraction of potential savings

Potential annual NSW savings from energy efficiency measures



Key:

Significant activity in Australian schemes

Some activity in Australian schemes

Source: Office of Environment and Heritage (2013) NSW Energy Efficiency Action Plan

*Note: CFLs = compact fluorescent lamps and LEDs = light-emitting diodes

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M&V vs default methods

Default savings factors

- Activity & technology *specific*
- Policymaker determines pre-calculated *savings*
- Compliance demonstrates the number of activities implemented
- E.g. activities (Install/Replace/ Buy/Sell/Remove/Modify)

M&V methods

- Activity & Technology *neutral*
- Policy maker determines savings calculation *method*
- Compliance demonstrates activity implemented ***and*** calculation method followed

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Limits on default savings factor methods

In 2011 NSW expanded M&V methods to address limits on existing methods

- Heterogeneity of savings across similar building/activity types
- Activities and technologies for which there are adequate data sets to pre-calculate savings
- Policy risk of adopting methods based on weak data sets
- Lack of methods creating barriers to innovation in new efficiency solutions

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Australian M&V methods

There are notionally thirteen M&V methods nationally in Australian EEOs/Baseline & credit schemes

ESS (NSW)

- Project Impact Assessment (PIA)
- PIA M&V Single site
- PIA M&V Multi-site
- MBM Baseline per unit of output
- MBM Baseline unaffected by output
- MBM Normalised baseline
- MBM NABERS Baseline
- MBM Aggregated metered baseline

VEU (Victoria)

- Project Based Assessment

REES (South Australia)

- Aggregated metered baseline

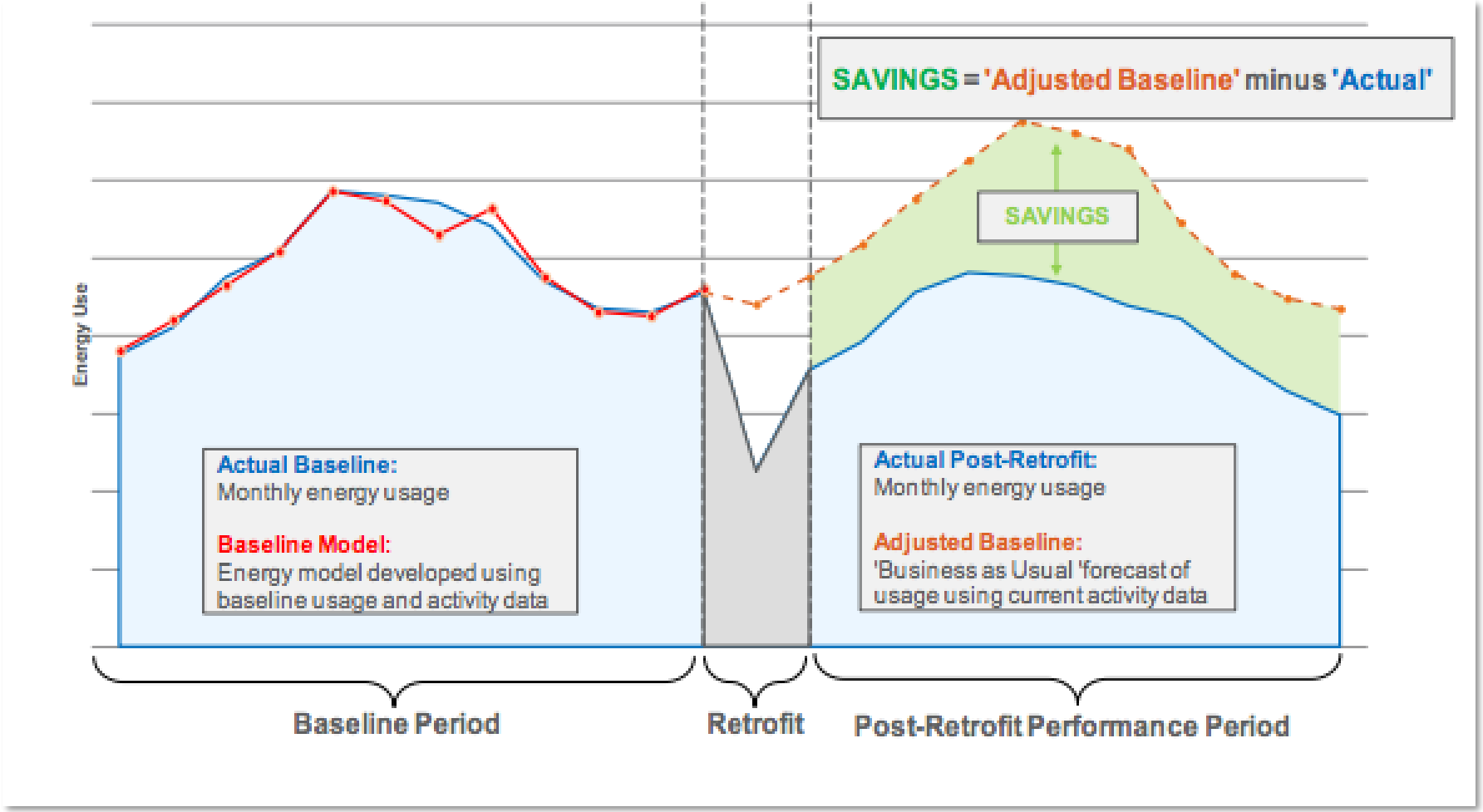
ERF (National)

- Industrial Energy & Fuel Efficiency
- Commercial Buildings
- Aggregated Small Energy User

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Project impact assessment with M&V (PIAM&V)

Equivalent to VEU PBC and ERF IEFE



Source: NSW Office of Environment and Heritage, 2013

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The M&V Professional (MVP)

Example Requirements from ESS:

Competency	Requirement
Understanding of: ▾ best practice measurement & verification techniques, and ▾ end-user equipment, end-use services and independent variables in the RESA	Provide written evidence to demonstrate appropriate education, skills, experience and/or training in accordance with local or national guidelines, including: ▾ relevant technical skills specific to the energy uses, scope, boundaries and project objective ▾ a demonstrated record of performance on similar projects covering a range of end-uses ▾ knowledge of appropriate legal and other requirements ▾ familiarity with the energy uses in the RESA, and ▾ knowledge of the requirements of relevant guides[a] and standards[b] for conducting measurement and verification.
Demonstration of ability to perform regression analysis	If the RESA will use regression analysis to develop energy models, describe the skills, experience and qualifications that demonstrate an ability to perform regression analysis.
Demonstration of ability to calibrate outputs from a computer simulation	If the RESA will use computer simulation to develop energy models, describe the skills, experience and qualifications that demonstrate an ability to calibrate outputs from a computer simulation.

a Such as the NSW Office of Environment and Heritage's Measurement and Verification Operational Guide.

b Such as the International Performance Measurement and Verification Protocol.

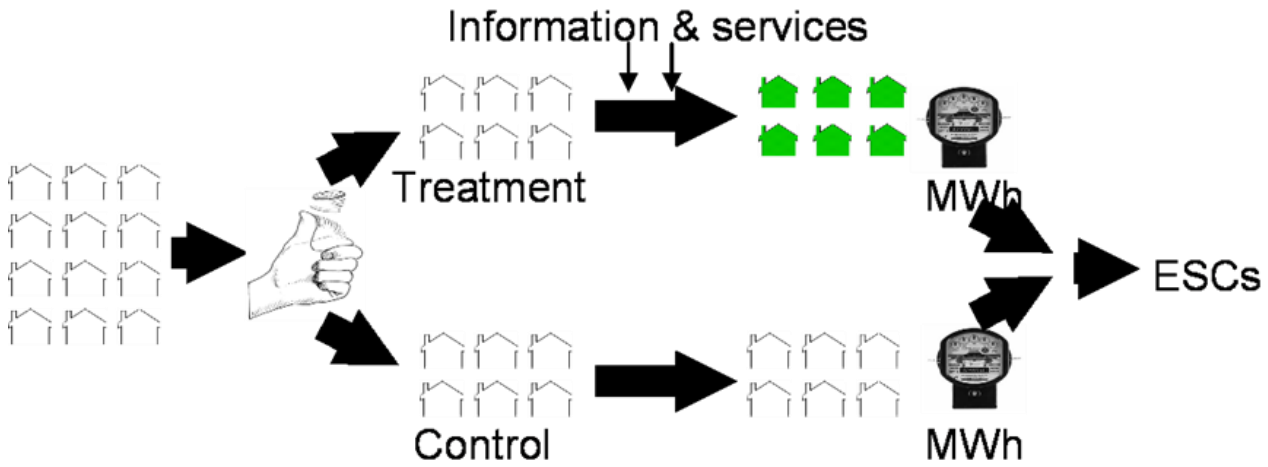
Notional implementation

- Administrator approved and governed panel of MVPs
- MVP contracting to Administrator
- Paid for by aggregator/installer
- Independent MVP auditors maintain panel quality

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AMB is based on randomised controlled trials

Current method



- No forward creation – requires ongoing measurement and calculation
- Best suited for energy saving behaviour, information & control devices
- No minimum group size (statistical significance)
- Project origination – existing customer relationship
- Accounts for overlap with other programs
- Independent verification by statistician
- Opt-out programs

Source: NSW Government

Alternative approaches

1 RCT with recruit-and-deny

2 RCT with recruit-and-delay

3 RCT with encouragement design

4 Regression discontinuity

5 Stepped wedge

6 Rolling control (“Variation in adoption”)

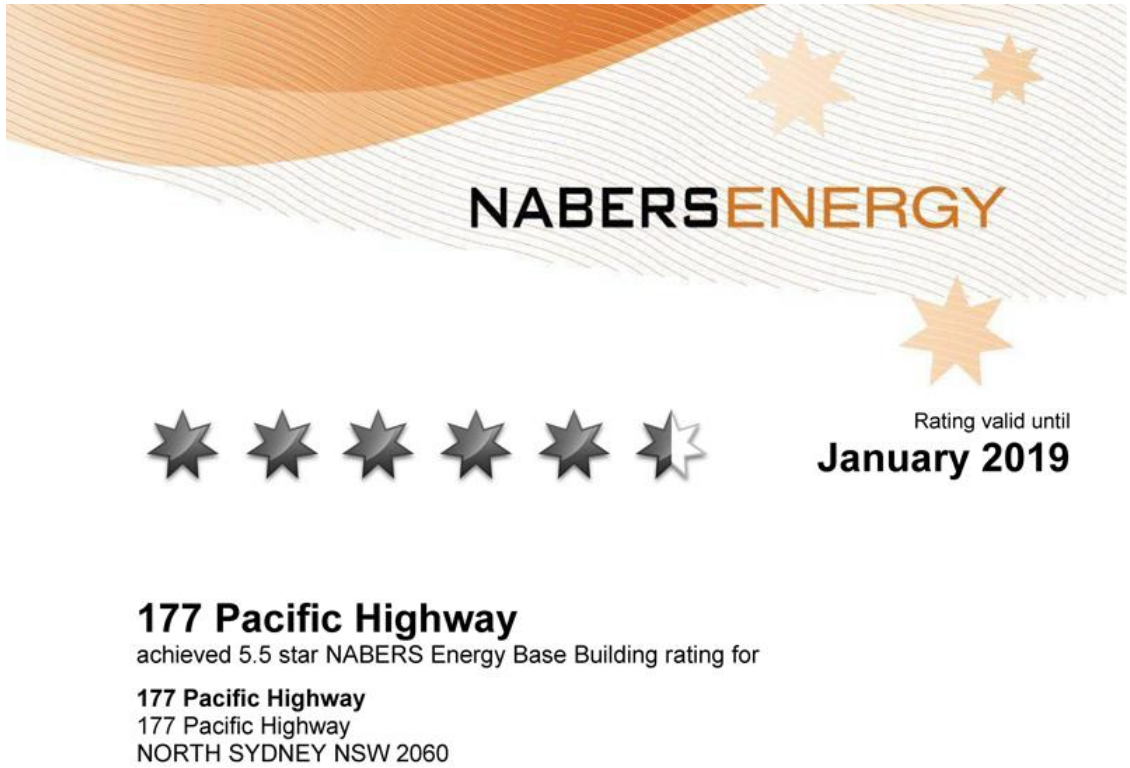
7 Match on observables

8 Matched control (with propensity scoring)

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The NABERS / Commercial buildings method

Example NABERS certificate



Method features

- NABERS certificates benchmark operational building energy use
- Certificate validity independently managed by NABERS administrator
- Savings automatically calculated when new certificates obtained
- Limited forward creation
- Limited normalisation

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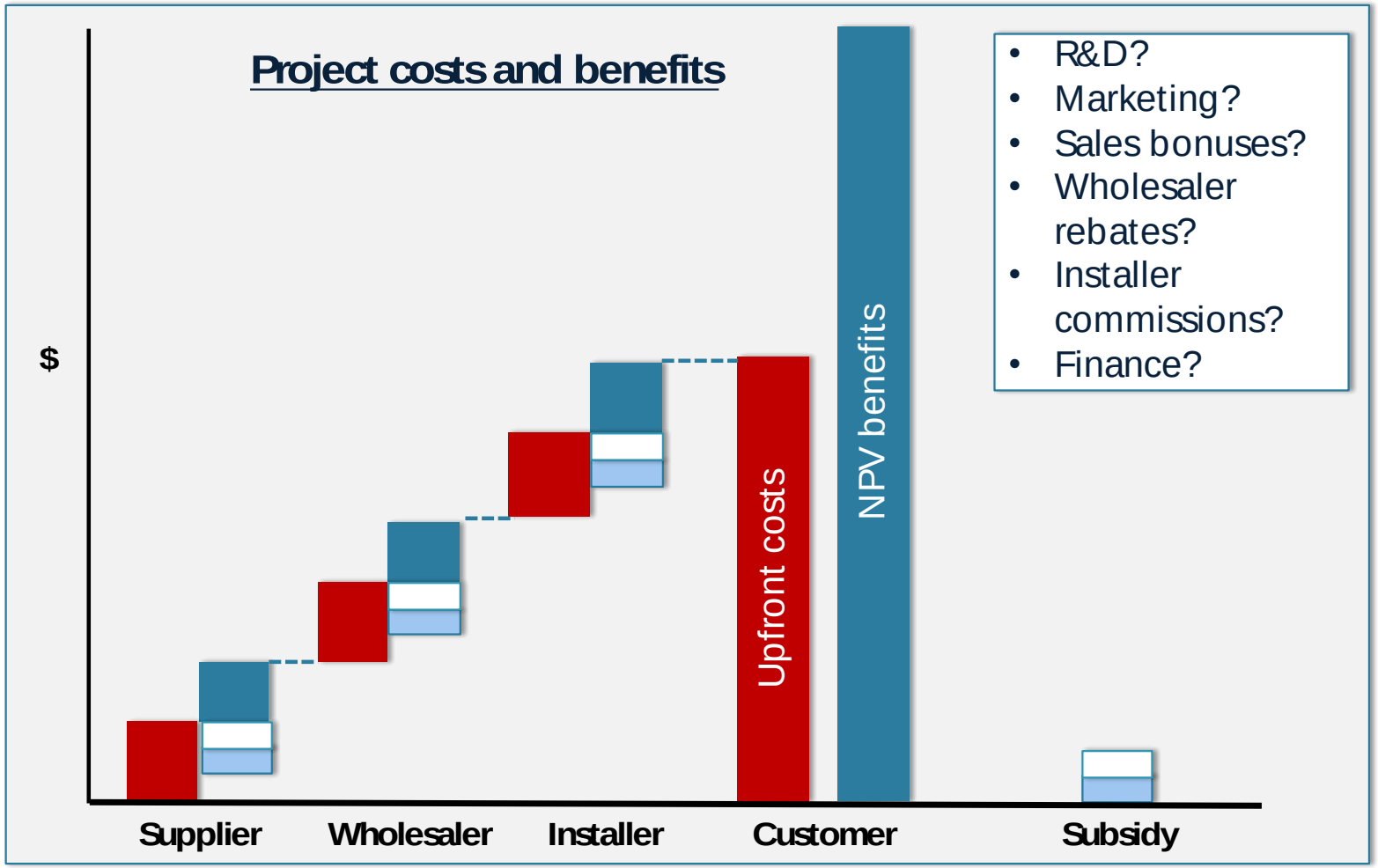
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Challenges and opportunities

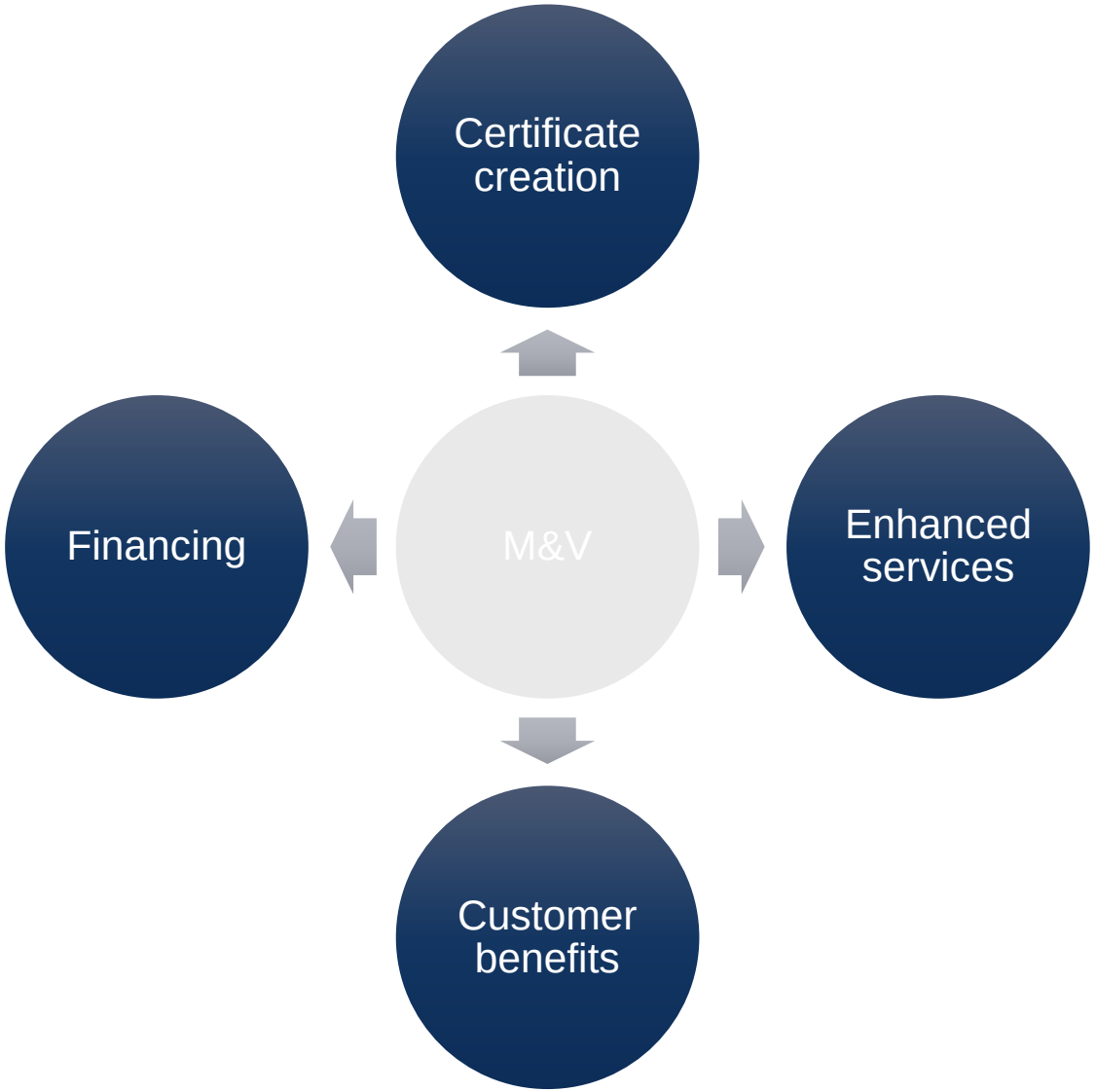
M&V methods and activities are more expensive

The market needs to develop new business models



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M&V has benefits beyond compliance



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Scheme administration must support market development

There are trade-offs between accuracy and additionality

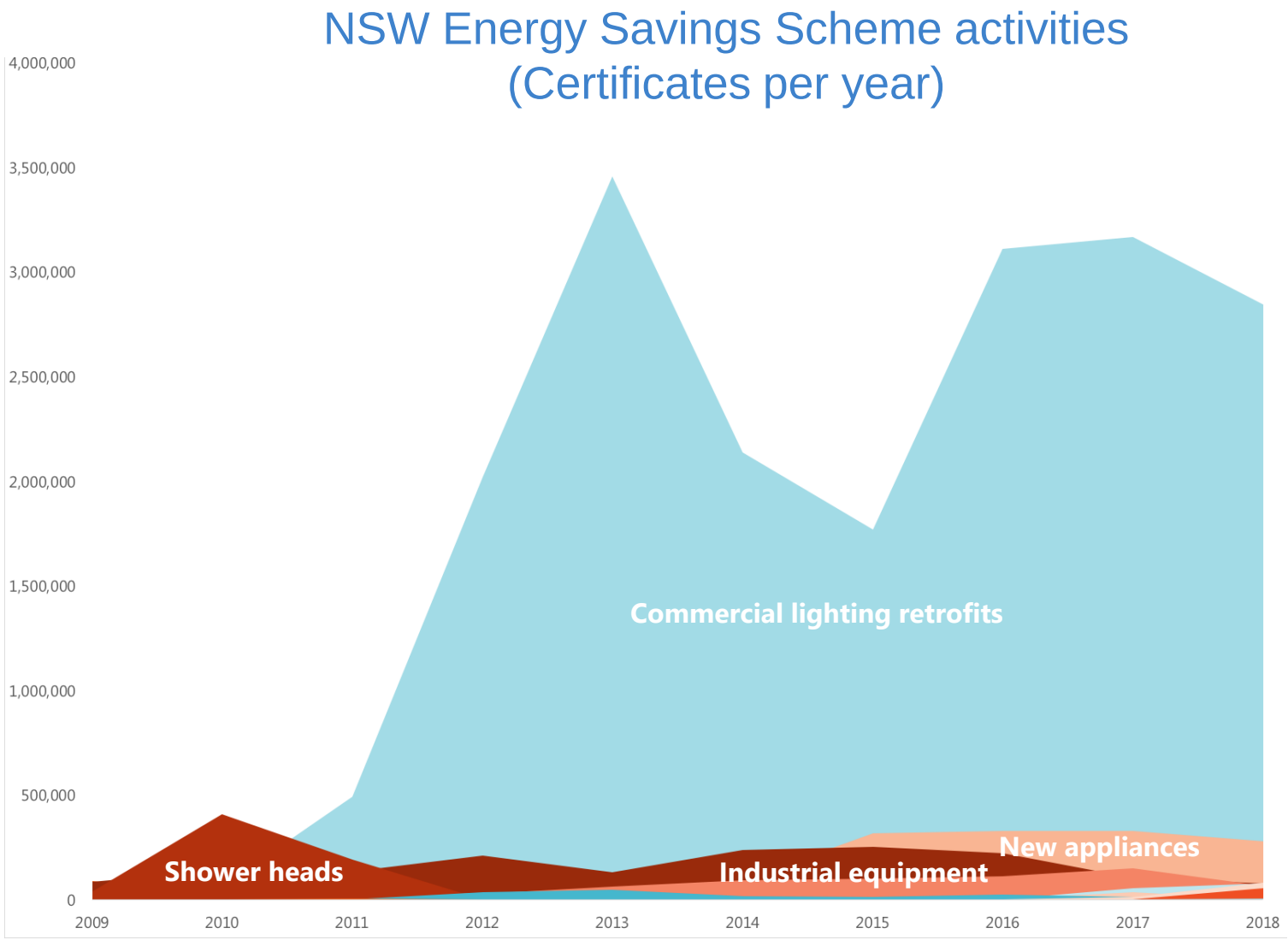


- The higher administrative burden the less likely projects will be additional
- Methods discount for lower accuracy
- Administration needs to be streamlined
- Policy makers must let price signals work

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A single commodity market is a strength and limitation

Lowest marginal cost activities tend to crowd out others and delay innovation



Source: IPART (20190 Raw EES Registry data, Common Capital analysis

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EEO can only do so much on their own

EEOs are an engine for retrofits, but need complementary programs



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Questions

Henry Adams
Director
+61 412 622 915
henry.adams@commoncapital.com.au

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