

May 18, 2015

Review of the Victorian Energy Efficiency Target scheme
Department of Economic Development, Jobs, Transport & Resources
Energy Sector Development Division
GPO Box 4509
Melbourne VIC 3001

RE: Opower response to the April 2015 consultation paper, "Setting Future Victorian Energy Efficiency Targets."

Dear Sir or Madam:

Opower appreciates this opportunity to participate in this review of the Victorian Energy Efficiency Target (VEET) scheme. Further, we congratulate the Victorian Government on its decision to retain the VEET scheme and strengthen it through this extensive review. Opower's goal in submitting these comments is to assist the Energy Sector Development Division as it contemplates how to improve the VEET scheme to achieve optimal energy-saving outcomes that benefit Victoria's domestic electricity and gas consumers.

Opower is an enterprise software company that is transforming the way energy retailers and distribution companies engage with their customers. Opower's customer engagement platform enables these energy providers to reach their customers at moments that matter through proactive communications that drive energy savings and demand reduction, increase customer engagement and satisfaction, and lower customer operation costs. Opower's software has been deployed to more than 95 utility partners around the world and reaches more than 55 million households and businesses. Having run hundreds of large scale field tests, and been subject to over 40 independent programme evaluations, Opower has amassed the world's largest body of experience in delivering behavioural demand-side management programmes.

Opower's most pressing concern with VEET is that that scheme does not currently recognize or incentivize verifiable energy savings from behavioural energy efficiency programmes. In this important regard, VEET stands in stark contrast with other successful energy efficiency schemes in Australia and internationally. New South Wales,¹ South Australia,² and the Australian Ministry of Environment³ have each approved measurement and verification methodologies that accommodate and encourage behavioural energy efficiency, joining 35 jurisdictions in North America and three in Europe. By excluding such programmes from eligibility under current the VEET rules, Victoria is failing to capture over 65 million AUD in bill savings, 200 gigawatt hours of electricity and 850,000 gigajoules of gas in cost-effective energy savings, and 250,000 tonnes of avoided CO2 emissions.⁴

If harmonization with the New South Wales Energy Savings Scheme is a goal, then mutual acceptance of

methodologies as approved by each state regulator would be a key step. However, we recognize that such a move could take time. Given a version of the Aggregated Metered Baseline or Aggregated Small Energy Users methodology has been approved in three Australian jurisdictions – and therefore gone through rigorous review in each – we request that this methodology be fast-tracked for approval in the revised VEET and be ready for use as of January 2016. This would allow Victorian households to benefit from bill savings, and enable Victoria to gain from additional cost-effective gas and electricity savings without delay.

If approved within the VEET, behavioural energy efficiency programmes will bring additional benefits and greater equity, in particular helping address concerns regarding high disconnection rates and hardship customers' ability to pay:

- Low income households are readily reachable and save at same rates as other income groups, and are highly supportive of these programmes (see response to question 6 below for more detail)
- Behavioural programmes also reach all age groups, urban and non-urban – achieving similar savings rates across all demographics.

As stated above, Moreover, regulatory commissions in jurisdictions with a tradition of leading on energy efficiency are coming to see behavioural programmes as a core element of the portfolios they oversee and have placed additional regulatory emphasis on these programmes:

- The Massachusetts Department of Public Utilities recently approved a 3-year, 3.7 TWh statewide efficiency plan that relies on behavioural efficiency programmes to drive 24% of electricity savings and 20% of gas savings.⁵
- Within the framework approved by the Rhode Island Public Utility Commission to require investment in all cost-effective energy efficiency, National Grid's behavioural efficiency programme will soon reach all of Rhode Island's 425,000 households – the first fully statewide behavioral programme in the US.⁶
- The California Public Utility Commission sets a “floor” on utility investment in behavioural energy efficiency, by requiring that no less than 5% of residential households in each investor-owned utility participate in behavioral programmes by 2014.⁷

Regulators in each of these states have come to the same conclusion: hardware-based programmes and behavioural programmes complement one another, and together deliver more cost-effective energy efficiency benefits more equitably than either could alone.

As stated above, our key issue of concern is the inclusion of the AMB or Aggregated Small Energy Users methodology, however, we would also like to comment on the following questions:

1. What should the new VEET target be?

Please indicate your preferred option:

- 5.4 million tonnes CO₂-e per year for three years
- 5.8 million tonnes CO₂-e per year for three years

- 6.2 million tonnes CO2-e per year for three years
 - 5.8 million tonnes CO2-e per year for five years
 - 6.2 million tonnes CO2-e per year for five years Other option (please specify level of target and length)
- Please outline why you believe this option is preferred.

5-year target will provide greater regulatory certainty and better ensure optimal savings outcomes.

In principal, efficacy of the incentive to invest in the optimal mix of demand side management options depends in large part on the degree of regulatory certainty registered by both obligated compliance buyers and EE technology providers. If compliance timelines are short, or there is a lack of faith that the VEET scheme will persist after 2018, it is more likely that we will see a lack of investment in innovative approaches and the scheme may fail to produce the desired level of cost-effective energy savings.

Higher annual target – 5.8 or 6.2 million tonnes – to accommodate new methodologies.

Incorporating new methodologies will expand the low cost savings potential. We recommend raising the target accordingly. Opower's proven solutions alone have the potential to generate over 250,000 tonnes of CO2e mitigation each year, once those programmes reach maturity (typically during the 3rd year). McKinsey & Company research suggests that the full potential for behavioural change is up to 10x higher – 15-20% of total residential energy usage, or about 1.7 to 2.4 million tonnes of CO2e.⁸

2. Comments are invited on the modelling approach used to determine the costs and benefits of the VEET scheme. Is there any additional data or information that should be considered?

The scope of the VEET scheme should be explicitly broadened to include non-hardware approaches that generate verifiable energy savings. In parallel, the modeling approach used to determine costs and benefits of the scheme should also seek to incorporate the potential for behavioural energy efficiency.

As a result of excluding non-hardware approaches that can influence and accurately measure the impact of energy use behaviour change, the VEET leaves a large tranche of cost-effective energy savings on the table. McKinsey & Company research in both the UK⁹ and the US¹⁰ suggests that the full potential of behavioural energy efficiency is 15-20% of Victoria's residential energy usage.¹¹ Opower's experience suggests that over 2% of domestic energy usage can be cost-effectively reduced, measured, and verified using off the shelf software that enables behavioural customer engagement at scale.

3. Which greenhouse gas coefficient should be used to quantify the reduction in greenhouse gas emissions achieved by the VEET scheme?

- existing marginal coefficient
- updated marginal coefficient
- an average coefficient (as published in the National Greenhouse Accounts)
- other option (please specify?) Please outline why you believe this option is preferred.

Updated marginal coefficient.

4. The Department has valued greenhouse gas emissions reductions attributed to the VEET scheme by adopting a carbon valuation series that was produced by the Federal Climate Change Authority as part of its 2014 Targets and Progress Review.
Is this approach appropriate for valuing greenhouse gas emissions reductions over the period 2016 to 2050?

Rather than take a view on carbon pricing via a market, a truer price is the social cost of carbon. This would give a true cost to carbon emissions versus a cost of abatement. One reason for doing this is that with no current abatement target federally there is no effective cost of abatement in Australia.¹²

However, a more principled reason is that the social cost of carbon is a truer estimate of the cost of emissions as it looks at the true impacts of carbon emissions on a global scale as emissions impacts are a global problem.

As part of the US Clean Power Plan, in 2013 the US Environmental Protection Agency updated its estimate of this cost in a conservative manner that takes into account the true global cost of emissions.¹³ US state and federal impact assessments must take into account this social cost in evaluating costs and benefits of policy alternatives. We thus recommend this analysis as an appropriate point of comparison for the current VEET scheme review.

5. Is there a case to exclude any business sector(s) from participation in the VEET scheme?
Please explain why this is your preferred option, and comment on how this should be implemented.

No. The market should create a level playing field that enables all cost-effective energy efficiency to emerge and be rewarded. The bigger and more robust this market, the better for the entire EE ecosystem and for all Victorians.

6. Should the VEET scheme be amended to better ensure support for low income households?
Please outline how the VEET scheme could better support low income households, and comment on why this option should be preferred.

Yes, the VEET scheme provides a ready mechanism to incentivize activities to assist low-income households with the least ability to absorb high energy bills and most at danger of being disconnected from service for failure to pay. However, without a low-income target or a multiplier applied to activities in low income households, those activities are less likely to take place.

South Australia is a positive example. The South Australian Residential Energy Efficiency Scheme mandates that 35% of all activities must target low-income householders. The South Australian Department of Manufacturing, Innovation, Trade, Resources and Energy cites an independent review as part of its 2013 Directions Paper¹⁴ on the REES as framing key reasons for keeping the low-income target as low-income households:

- “spend a greater proportion of their disposable income on fuel in general and therefore find it harder to absorb energy price rises
- tend to be less efficient to begin with, with older, less efficient appliances, such as hot water systems, refrigerators and insulation
- tend to lack access to financing, reducing their ability to implement longer term measures which require up front capital expenditure
- lack information regarding possible energy efficiency measures”¹⁵

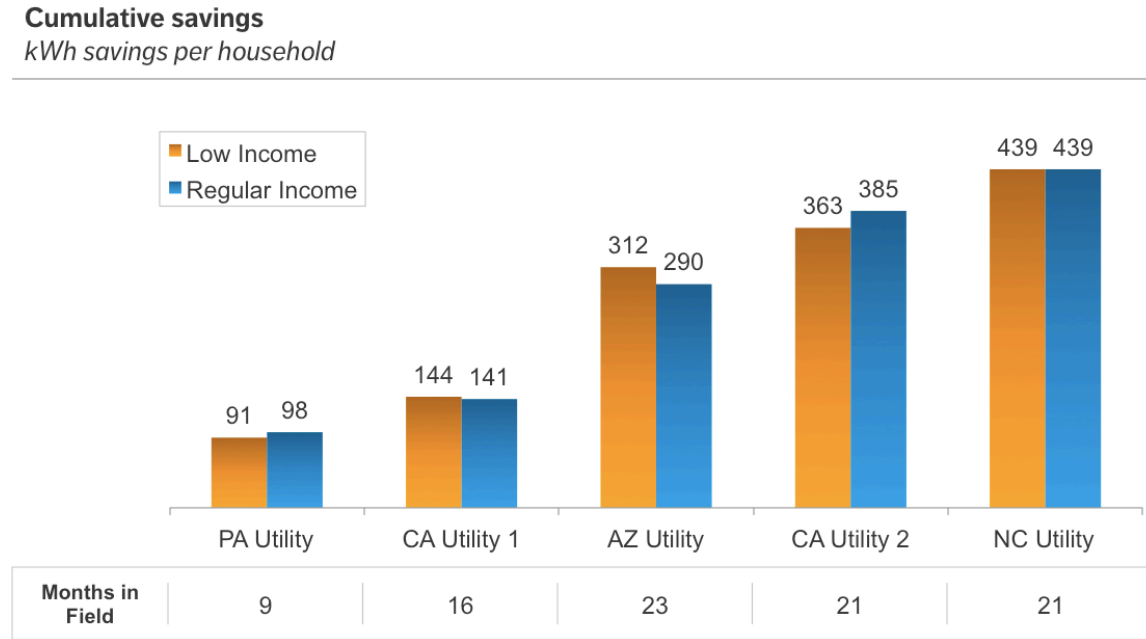
The review also notes that the phone survey of householders undertaken as part of the independent review showed low-income were most favourable toward the programme.

If Victoria followed South Australia’s model, the Minister could assist in tackling her concerns regarding low-income households and their ability to afford electricity services and avoid future disconnections¹⁶.

Assisting low-income families is also an additional reason for fast-tracking approval of behavioural energy efficiency programmes as these programmes can drive energy saving behavior consistently across all demographic groups.

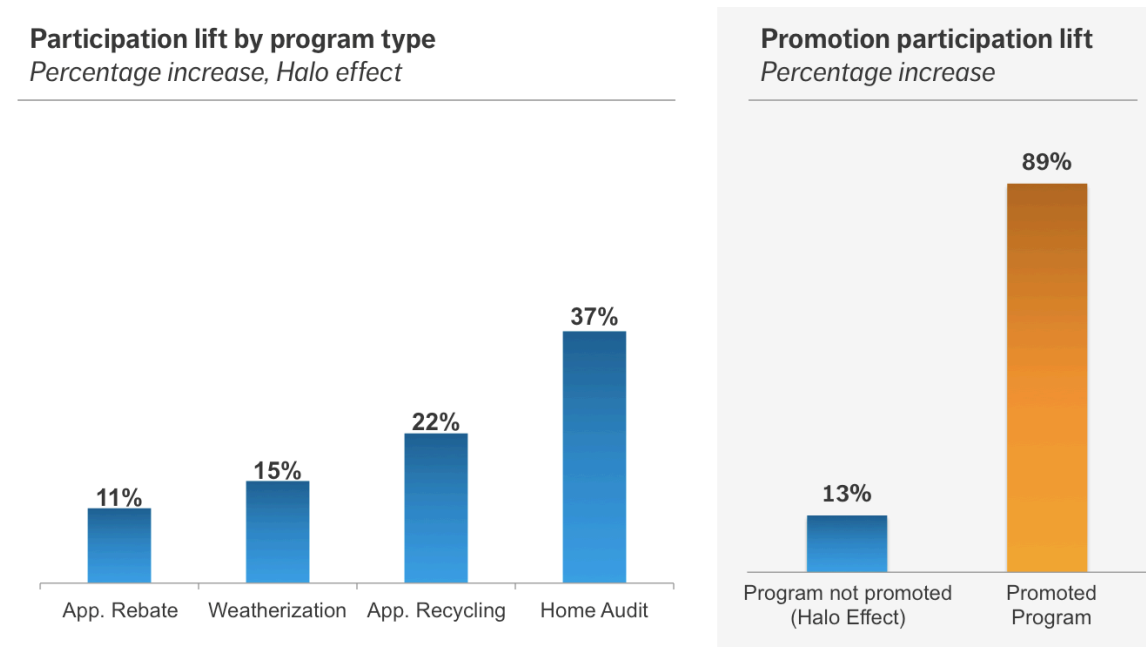
Experimental design of large-scale behavioural efficiency programmes enables accurate measurement of the distribution of benefits among different customer groups. Opower results show that savings rates per home are consistent across all customer segments, including low-income households, rural consumers, and the elderly.

Figure 1: Low-income households save as much as regular-income households



In the U.S. we also see that utility investments in information-based behavioural efficiency drive higher participation in other programmes that deliver low-cost installed measures – programmes that low income households are more likely to participate in.

Figure 2: Behavioural measures amplify uptake of other measures



7. In addition to expanding the range of energy efficiency activities available in VEET, should any other action be taken to target participation by certain groups?

See the argument for low-income inclusion above in question 6.

We would also argue that the review should consider whether non-urban areas are being underserved. In other schemes, we see that implementers focus on urban areas where they can most easily get to households and do more installations in a day than they could in a non-urban environment. NSW is looking to adopt a regional multiplier to ensure equitable distribution of EE services. We would recommend this be looked at for the VEET and that the multiplier be in line with the cost to serve those customers to ensure VEET activity is not confined to urban areas.

It should be noted that behavioural programmes like Opower's do not suffer from this urban bias – programmes can target any householders the retailer or network distributor chooses with no cost penalty.

Finally, we recognize that it might be too complex for the VEET scheme to address areas of network constraint where demand management activities would have potentially even larger benefits and could lower network costs. If this is the case, we would hope that the department could address this issue via another programme – potentially requiring networks to publish their constrained areas and the price that demand management is worth to them in those areas.

8. Please suggest up to five activities that should be prioritised for revision or introduction to the VEET scheme.
Please outline why you believe these activities should be prioritised.

The VEET's exclusive focus on hardware-based measures leaves significant potential for cost-effective energy efficiency on the table. Allowing the inclusion of behavioural energy efficiency programmes through approval of an AMB or Aggregated Small Users methodology should be the priority.

Nearly three years ago, MIT researcher Hunt Alcott identified the aggregate of Opower's programmes as "one of the largest randomized field experiments in history." The results from this ongoing experiment have enabled regulators and utilities alike to better understand the cost-effective potential savings from non-hardware efficiency programmes designed to overcome information gaps and behavioural factors.

In his article published in the *Journal of Public Economics*, Dr. Alcott found that information-enabled behavioural efficiency consistently improves household energy efficiency by 1.4 to 3.3 percent, with an

average of 2.0%, and that these savings persist over time if treatment is maintained. He further established that:

“Non-price interventions can substantially and cost effectively change consumer behaviour: the effect is equivalent to that of a short-run electricity price increase of 11 to 20%, and the cost effectiveness compares favourably to that of traditional energy conservation programs.”¹⁷

A majority of the 600,000 households included in Dr. Alcott’s study are located in states where energy efficiency policy and regulation were well established prior to the implementation of behavioural programmes.

Like Victoria today, these states already had an established track record of success in reducing energy use and emissions by incentivizing investment in efficient lighting and other low-cost installed measures. In short, Dr. Alcott’s findings suggest that behavioural programmes deliver impacts that are distinct and complementary to the limited list of prescribed activities currently incentivized by existing VEET regulations.

Today, more than 55 million households globally participate in Opower programs, and every utility that has partnered with Opower to drive energy efficiency has achieved statistically significant energy savings.¹⁸ TO date, these programs have saved customers over USD 965 million in bill savings, 7.7 terawatt hours in energy savings, and 5.3 million tonnes in abated CO2 emissions. As the impact of behavioural efficiency programmes has scaled up, so too has the evidence from independent evaluators verifying their results: Dr. Alcott’s findings have been confirmed in over forty separate publications.¹⁹

The consistent energy saving outcomes driven by behavioural programmes help quantify the market barriers that the ESI’s hardware-only approach fails to address. We estimate that each year, Victoria is losing over over AUD 65 million in bill savings, 200 gigawatt hours of electricity and 850,000 gigajoules of gas in cost-effective energy savings, and 250,000 tonnes of avoided CO2 emissions. In other words, Victorians are unnecessarily paying to power the equivalent of 40 thousand homes that could be “taken off the grid” by an ESI that incentivizes the provision of information-enabled behavioural efficiency.²⁰

9. Please suggest up to three changes which should be made to improve the VEET scheme. Please outline why you believe these changes should be a priority.

As suggested by the foregoing comments, Opower recommends:

1. Inclusion of an Aggregated Metered Baseline or Aggregated Small Users method for measurement and verification of energy savings from behavioural energy efficiency programmes.
2. Fast-tracking the adoption of this methodology as part of the rule changes that go into effect in January 2016, as an explicit means to encourage cost-effective delivery of VEET scheme benefits to underserved populations, such as non-urban customers and hardship customers.

3. Considering the social cost of carbon as a more accurate estimate of the value of emissions reductions.

Opower appreciates the Energy Sector Development Division's interest in assessing whether the mix of activities included in the VEET scheme has been appropriate to maximise energy efficiency uptake. We believe that a VEET that fails to incentivize behavioural efficiency will fall short of that goal. Behavioural programmes have been approved in more than 40 jurisdictions – including three in Australia. Opower looks forward to facilitating the Government's ability to ensure Victoria also is able to benefit from behavioural programmes as part of the stronger VEET scheme that will come into force in January 2016.

We thank you for your consideration of our comments. We are excited by this review and the prospect that behavioural programmes may soon assist Victorians of every economic level benefit from bill savings and from the overall benefits that come from energy efficiency and GHG abatement.

Sincerely,

Adam Welsh
Senior Director of Regulatory Affairs for Asia-Pacific
Opower

¹ NSW Minister for Resources and Energy approved the "Aggregated Metered Baseline method" for measuring aggregated energy savings from residential and commercial end-users on 30 May 2014, as part of the broader amendment to the Energy Savings Scheme. See New South Wales Gazette no. 49 p 1887. Also see:

http://www.ess.nsw.gov.au/Methods_for_calculating_energy_savings/Aggregated_Metered_Baseline

² South Australia Minister for Mineral Resources and Energy gazetted on December 18 2014 a revised list of energy efficiency activities that can be undertaken for the revised Retailer Energy Efficiency Scheme (REES). Information on the "Aggregate Metered Baseline Method (AMB)" can be found on the SA Essential Services Commission website. See: http://www.sa.gov.au/__data/assets/pdf_file/0019/135910/REES-activities-27-Aggregate-Metered-Baseline-Method.pdf

³ See: <http://www.environment.gov.au/climate-change/emissions-reduction-fund/methods/aggregated-small-energy-users>

The Carbon Credits (Carbon Farming Initiative - Aggregated Small Energy Users) Methodology Determination 2015 was made on 25 March 2015 and is available here:

<http://www.comlaw.gov.au/Details/F2015L00345>.

⁴ These figures correspond with our conservative estimate for the average annual impact of a 5-year Opower behavioural energy efficiency program that reaches all 2,345,000 domestic energy customers in Victoria with Home Energy Reports that deliver targeted analysis and efficiency tips related to both electricity and natural gas consumption. Key assumptions: Average per customer annual domestic consumption is 5,502 kWh of electricity (source: ESAA) and 43 GJ of gas (source: Victoria DSBDI Gas Market Taskforce Final Report Oct. 2013); electricity savings rates ramp from 1.0% in year 1, to 1.5% in year 2, to 2.0% in years 3 to 5; gas savings rates ramp from 0.5% in year 1, to 0.8% in year 2, to 1.0% in year 3 (source: Opower's 400+ client-years of experience delivering BEE on behalf of electricity and gas utilities); emissions factors of 1.01 tCO₂e/MWh and 55.23 kgCO₂e/GJ (source: VEET review document);

retail cost of electricity, 0.31 AUD/kWh (source: AER State of Energy Markets Report 2014); retail cost of gas, 6.00 AUD/GJ (source: Victoria Essential Services Commission 2013-14 report on pricing)

⁵ DPU Order Approving 2013-2015 Three-Year Electric & Gas Energy Efficiency Plans, relating to dockets 12-100 to 12-111.

See: <http://www.ma-eeac.org/DPU%20Proceedings.html>

⁶ Rhode Island Public Utilities Commission, Docket 4284. See: <http://www.ripuc.org/eventsactions/docket/4284page.html>

⁷ “Decision Providing Guidance on 2013-2014 Energy Efficiency Portfolios and 2012 Marketing, Education, and Outreach,” Public Utilities Commission of the State of California, Decision 12-05-015, May 10, 2012.

⁸ See notes 9 and 10 below.

⁹ “Behavioural change is a significant opportunity in the residential sector, with potential as high as ~15%.”

Slide 31 of 129: UK Department of Environment and Climate Change. “Capturing the full electricity efficiency potential of the U.K.” McKinsey & Company report commissioned by DECC to support UK’s transposition of the EU Energy Efficiency Directive. November 2012.

¹⁰ “Behavioral measures, combined with innovative technology offerings, could result in overall energy-efficiency savings representing as much as 20 percent of total US residential-energy consumption. Taking steps to realize this untapped opportunity could significantly reshape the relationship among utilities, other services providers, and their customers over the next few years.” From: Frankel, D., S. Heck and H. Tai. “Sizing the potential of behavioral energy-efficiency initiatives in the US residential market.” McKinsey & Company, Electric Power/Natural Gas (Americas). November 2013.

¹¹ To Opower’s knowledge, McKinsey & Company have not yet conducted comparable research in Victoria or elsewhere in Australia. However, energy usage patterns in Victoria generally fall in between those observed in the UK (where average usage is slightly lower) and the US (where average usage is higher).

¹² The CCA study assumed a market price for abatement of carbon emissions. It assumed that the carbon pricing mechanism would be in place. That doesn’t reflect the current reality. Without such a cap as was formerly provided by the carbon pricing mechanism, there is currently no valid means to determine a market cost of carbon in Australia. Further, even if the market were functioning as earlier envisioned, a market price for abatement does not represent the actual cost of emissions, it represents the cost of abatement, given a certain cap or quantity goal.

¹³ See the EPA’s analysis here: <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>

¹⁴ https://www.sa.gov.au/__data/assets/pdf_file/0018/22149/REES20Review20-20Directions20Paper202013.pdf

¹⁵ P. 17, https://www.sa.gov.au/__data/assets/pdf_file/0018/22149/REES20Review20-20Directions20Paper202013.pdf

¹⁶ <http://www.theage.com.au/victoria/soaring-power-costs-leads-to-record-number-of-disconnections-in-victoria-20150218-13i4lt.html>

¹⁷ Allcott, Hunt, October 2011, “Social Norms and Energy Conservation,” *Journal of Public Economics*, available here: <http://web.mit.edu/allcott/www/Allcott%202011%20JPubEc%20-%20Social%20Norms%20and%20Energy%20Conservation.pdf>

¹⁸ Opower’s opt-out experimental program design uses randomised controlled trials that enable rigorous ex-post measurement and verification of results. For more detailed discussion of the practice and benefits of using randomised controlled trials to measure energy savings, see “Opower’s Response to Issues Paper – Project Based Assessments in the Energy Saver Incentive,” submitted to the Department of Primary Industry on 22 February 2013.

¹⁹ A complete and frequently updated library of independent evaluations of Opower energy efficiency programs is available online: <http://opower.com/company/library/verification-reports>

²⁰ See note 4