



## **Ensuring Consumer Protections for Purchasers of Residential Battery Storage Systems**

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## Introduction

Australia currently has the highest proportion of households with photovoltaic solar systems installed of any country in the world<sup>1</sup>. Many of these households took advantage of generous solar feed-in tariff schemes that were offered by state governments to accelerate the deployment of small-scale renewable energy paying between 20c to 60c per kWh generated and then fed back into the grid<sup>2</sup>. These solar bonus schemes changed the often already favourable economics associated with the installation of PV solar for many households, significantly reducing their household energy bills during a period in which electricity prices increased sharply within the Australian market. Indeed, over the past decade the residential electricity prices across Australia have increased on average by 106 per cent.<sup>3</sup>

With the end of the solar bonus schemes in New South Wales, Queensland and Victoria in late 2016 and early 2017, many of these households are experiencing “bill shock.” In 2017 alone, some electricity retailers have increased their electricity tariffs by almost 20%.<sup>4</sup> At the same time as charging record prices, many retailers have simultaneously slashed the solar feed-in tariffs they offer to their customers, with some retailers offering tariffs as low as 6c to 10c per kWh.<sup>5</sup> Currently, peak electricity in Australia can cost as much as 44c per kWh.<sup>6</sup> As a result, increasing numbers of residential customers are investigating installation of battery storage systems to complement their existing or new photovoltaic solar systems. Indeed, the first national audit of residential battery storage systems in the Australian market found that almost 7000 systems were installed in 2016,

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<sup>1</sup> Samantha Donovan, “Australia leads world in household solar panel installations”, *ABC News* (online), 29 September 2015, <http://www.abc.net.au/news/2015-09-29/australia-leads-world-in-installation-of-household-solar-panels/6813532> ; Energy Supply Association of Australia, *Fact Sheet: Renewable Energy in Australia – How do we really compare?*, p. 4 <https://c311ba9548948e593297-96809452408ef41d0e4fdd00d5a5d157.ssl.cf2.rackcdn.com/2016-03-23-factcheck-renewables/ESA002-factsheet-renewables.pdf>

<sup>2</sup> NSW Government, Resources & Energy, *The Solar Bonus Scheme is closed*, <http://www.resourcesandenergy.nsw.gov.au/energy-consumers/solar/solar-bonus-scheme/the-solar-bonus-scheme-is-closed>

<sup>3</sup> Energy Matters, *Australian Energy Prices Soar 106% In A Decade* (14 February 2017) <http://www.energymatters.com.au/renewable-news/australian-electricity-prices-em5903/> ; Simon Benson and David Crowe, “Power price spike puts heat on ALP”, *The Australian* (online), 13 February 2017, <http://www.theaustralian.com.au/national-affairs/power-price-spike-puts-heat-on-alp/news-story/fc99ef058d958dc3f6d1769620bc9d13>

<sup>4</sup> EnergyAustralia, *Rate changes - Qld, NSW, ACT & SA*, 17 June 2017 <https://www.energyaustralia.com.au/home/help-and-support/faqs/rate-changes>

<sup>5</sup> Michael Slezak, “From solar boom to bill shock: Australians face loss of rooftop payments”, *The Guardian* (online), 31 July 2016, <https://www.theguardian.com/environment/2016/jul/31/australia-residents-solar-rooftop-lose-payments>

<sup>6</sup> See e.g., Energy Australia, *Energy Price Fact Sheet SA Residential (Electricity)*, 20 June 2017, [https://secure.energyaustralia.com.au/EnergyPriceFactSheets/Docs/EPFS/E\\_R\\_S\\_RSOT\\_SA\\_02-01-2017.pdf](https://secure.energyaustralia.com.au/EnergyPriceFactSheets/Docs/EPFS/E_R_S_RSOT_SA_02-01-2017.pdf). Note that the price quoted is prior to the 3 July 2017 price increases, with residential prices due to increase for EnergyAustralia customers in South Australia by 19.9%.

with the figure being predicted to triple in 2017.<sup>7</sup> What is remarkable about the Australian market for residential battery storage systems is that, for many households with PV solar installed, it is already cost competitive for them to also install a residential-scale battery storage system. Moreover, this level of growth is also occurring in the absence of any national or state-based subsidy schemes supporting their installation and/or use.<sup>89</sup> Thus Australia presents a highly attractive market for residential energy storage manufacturers and suppliers, with many of the large battery manufacturers using Australia as a test case. It is estimated that approximately 20 manufacturers are currently active in the Australian market, producing 90 products for sale in Australia.<sup>10</sup>

Despite recent falls in price, residential battery storage systems are still expensive to install (in excess of \$5000 for most systems) and there is a lack of transparent comparative data available on the relative performance of different systems, as well as their operating costs and recycling costs. In addition, if the batteries are improperly installed or maintained, have manufacturing defects or are subject to extreme weather events/natural disasters, they may pose a significant safety risk to the end-consumer. These risks are often poorly understood, and are exacerbated by both the lack of Australian Standards, and the lack of widely adopted international standards, covering residential battery storage safety, installation and performance.<sup>11</sup> As a result, contractual warranties and statutory consumer guarantees play an important role both in terms of inspiring consumer confidence in residential battery storage systems and in ensuring consumer protection for end-consumers.

This report will investigate the role and coverage of contractual warranties and statutory consumer guarantees for residential battery storage systems within the Australian market. Part I of this report will analyse the current problems associated with residential battery storage systems and the

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<sup>7</sup> Amy Bainbridge, "Solar batteries 'exploding' in popularity with uptake tipped to triple in 2017, audit finds", *ABC News* (online), 14 February 2017, <http://www.abc.net.au/news/2017-02-14/solar-batteries-like-tesla-exploding-in-popularity/8259830>

<sup>8</sup> Though note that Adelaide City Council has offered limited subsidies to businesses and community groups seeking to install energy storage systems which has undoubtedly encouraged the uptake of these systems in Adelaide. Adelaide City Council is the first, and currently, the only local government area to offer a specific subsidy for energy storage systems in Australia.

<sup>9</sup> Michael Slezak, "From solar boom to bill shock: Australians face loss of rooftop payments", *The Guardian* (online), 31 July 2016, <https://www.theguardian.com/environment/2016/jul/31/australia-residents-solar-rooftop-lose-payments>. See also: Jonathan Gifford, "Smart storage to power the Smarthome", *PV Magazine: Storage Special* (11 February 2015) [https://www.pv-magazine.com/magazine-archive/smart-storage-to-power-the-smarthome\\_100018181/](https://www.pv-magazine.com/magazine-archive/smart-storage-to-power-the-smarthome_100018181/); Rich Bowden, "Australia to lead world in solar and battery storage", *Solar Quotes* (1 November 2015) <https://www.solarquotes.com.au/blog/australia-to-lead-world-in-solar-and-battery-storage-report/>; Bruce Mountain, "Tesla's price shock: solar + battery as cheap as grid power", *Renew Economy* (4 November 2015) <http://reneweconomy.com.au/teslas-price-shock-solar-battery-as-cheap-as-grid-power-22265/>

<sup>10</sup> James Martin II, "Battery storage options are growing: What products are out there?", *Solar Choice* (28 September 2015) <https://www.solarchoice.net.au/blog/solar-battery-storage-products-in-australia-list>

<sup>11</sup> AECOM Australia Pty Ltd, *Energy Storage Study - A storage market review and recommendations for funding and knowledge sharing priorities* (13 July 2015) Australian Renewable Energy Agency, p. 22 <https://arena.gov.au/assets/2017/02/AECOM-Energy-Storage-Study.pdf>

specific climactic characteristics of the Australian market that are causing challenges within the market. Part II of this report will then consider the theoretical role of contractual warranties and statutory consumer guarantees. Part III of the report will discuss the results of a critical analysis of the contents of the contractual warranties available for existing residential battery storage products within the Australian market. In particular, this part will consider what is currently “the market standard”, and what is best practice in these contractual warranties. It will further identify the areas that consumers should examine closely prior to purchasing a residential battery storage system. The article will conclude in Part IV with an evaluation of how well the existing regime of contractual warranties and statutory consumer guarantees for residential battery storage systems protects consumer interests. This Part will also identify any gaps that exist within current regulations and consider whether further reforms may be warranted to ensure adequate end-consumer protection.

## 1. Current problems that are emerging with residential battery storage systems

Not all residential battery storage systems are the same. Batteries have complex chemistries, some of which, like lead-acid batteries, are safer than others, like lithium ion batteries, which can be highly volatile under high heat and/or pressure.<sup>12</sup> However, lithium ion batteries possess other positive characteristics such as a longer cycle life, faster charge times, lower maintenance requirements and lower weight, which make them attractive for use in batteries used in everyday electrical items like phones, electric vehicles, residential battery storage, and laptop computers.<sup>13</sup>

While the use of lithium ion batteries in residential battery storage systems is a fairly recent phenomenon, parallels can be drawn with the experience of using lithium ion batteries in other household or domestic products, albeit these batteries are often of a smaller scale. This experience suggests that a range of problems is likely to occur in residential battery storage systems. Table 1 (below) highlights a sample of the reported litigation involving the use of lithium ion batteries in household or domestic products in the United States and other overseas jurisdictions:

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<sup>12</sup> Anitha S. Subburaj, Bejoy N. Pushpakaran and Stephen B. Bayne, "Overview of grid connected renewable energy based battery products in USA" (2015) 45 *Renewable and Sustainable Energy Reviews* 219 – 234, 222.

<sup>13</sup> AECOM Australia Pty Ltd, *Energy Storage Study - A storage market review and recommendations for funding and knowledge sharing priorities* (13 July 2015) Australian Renewable Energy Agency, p. 24  
<https://arena.gov.au/assets/2017/02/AECOM-Energy-Storage-Study.pdf>

**Table 1: Selected history of battery litigation**

Case citation/s	Product	Facts	Issues	Outcome
<p><i>In re iPod Cases</i>, (2005) Judicial Council Coordination Proceeding No. 4355, San Mateo Co. Sup. Ct. (California)</p> <p><i>Mosley v Apple Computer, Inc.</i>, (2005) case 7-04-cv-5773, USDC, Southern District of New York. (New York)</p> <p>There were a number of similar cases in Canada including <i>Lenzi v Apple Canada, Inc.</i>; <i>Wolfe v Apple Computer, Inc. and Apple Canada, Inc.</i>; <i>Hirst v. Apple Canada, Inc.</i>; <i>Hamilton v. Apple Computer, Inc., and Apple Canada, Inc.</i></p>	Apple iPod	<p>This was a US class-action lawsuit against Apple in respect of poor battery performance and poor battery life. In particular, the plaintiffs claimed that their Apple “iPods failed to live up to claims that the rechargeable battery would last the product's lifetime and would be able to play music continuously for up to 10 hours” without being recharged.<sup>14</sup> Instead, the plaintiffs complained, they could only play music for 4 hours on their iPods before needing to recharge the battery and moreover, the total lifespan of the battery was often only 18 months or less.<sup>15</sup></p>	<p>Poor battery performance</p> <p>Poor battery life</p> <p>Misleading and deceptive conduct</p>	<p>The case settled for US\$15 million, which was used to reimburse up to 1.3m affected consumers, as well as pay legal costs and disbursements amounting to US \$2.77 million. The final settlement equated to US \$1500 for each class representative.<sup>16</sup></p> <p>Other claims associated with this settlement entitled any consumer who had purchased an affected iPod, could show their receipt and filled out a valid claim form being given a US\$50 voucher redeemable towards the purchase of any Apple products or services except iTunes downloads or iTunes gift certificates. Further, those consumers who experienced problems with either their battery life or battery performance were also eligible to have their battery or iPod replaced, and were given an extended warranty period of two years rather than the standard one-year warranty that was offered by Apple at the time.<sup>17</sup></p>
<p><i>Humberto Daniel Klee and David Walla, individually, and on behalf of a class of similarly situated individuals v Nissan North America, Inc.</i>, (CD Cal, No. 2:12-cv-08238-BRO-PJW, 10 November</p>	Electric vehicle batteries	<p>This case related to a failure by Nissan to disclose its recommendations that owners avoid charging the battery beyond 80% in order to mitigate battery damage; and that Nissan’s estimated 100 mile range was based on a fully charged battery, contrary to Nissan’s own recommendations.<sup>18</sup></p>	<p>Misleading and deceptive conduct</p> <p>Poor battery performance</p>	<p>Outcome: \$US24m (with \$5000 for each named plaintiff and payment of US\$1.9 million in the plaintiff’s attorneys fees) and Nissan upgraded its warranty to guarantee 70% usable capacity for five years or 60,000 miles, which ever came sooner.<sup>19</sup></p> <p>For LEAF Vehicles whose</p>

<sup>14</sup> Associated Press, San Francisco, “Apple Offers \$US50 for iPod battery problems”, *The Age* (online), 3 June 2015, <http://www.theage.com.au/news/Breaking/Apple-offer-to-settle-iPod-battery-suit/2005/06/03/1117568346839.html>

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

<sup>17</sup> Ibid.

<sup>18</sup> Ovidiu Sandru, *Nissan Leaf Lawsuit: New Battery Replacement for Unhappy Customers* (July 21, 2015) Green Optimistic <http://www.greenoptimistic.com/nissan-leaf-lawsuit-battery/#.VwGp4GP4Pzi>

Case citation/s	Product	Facts	Issues	Outcome
2013)		<p>The LEAF owners manual indicated that vehicle owners should expect to lose 20% of their battery's capacity over five years of operation. However many of the plaintiffs, reported that their vehicles had lost over 27.5% battery capacity within their first two years of operation. This problem was particularly pronounced in warmer climates in the United States in geographic areas such as Arizona, Texas and California.</p> <p>The plaintiffs in this case alleged that this amounted to misleading and deceptive conduct on the part of Nissan. In addition, they also claimed that the lack of an adequate active cooling system was a design defect, which led the batteries to suffer from heat - related damage and caused premature battery capacity loss.</p> <p>The class action further alleged that Nissan expressly excluded loss of battery capacity under its 8 year /100,000 mile battery warranty.</p>		batteries for beneath the 70% usable capacity guarantee during the warranty period, Nissan agreed to repair or replace the battery under warranty with a new or refurbished battery to restore the battery's capacity to at least 70% usable capacity.
<i>Helene Courtemanche v Honda Motor Co, Ltd, and Honda Canada Inc</i> [2014] QCCS 500-06-000601-126 (4 November 2014).	Hybrid vehicle battery	<p>The plaintiffs in this case filed a motion against Honda alleging that 'the Integrated Motor Assist battery system (IMA) in the 2006 through 2008 Honda Civic Hybrid (HCH) Models was defective and that a software product update issued by Honda on or about August 2010 adversely affected the performance and fuel efficiency of these models.'<sup>20</sup></p> <p>Further, they alleged that Honda failed to 'adequately</p>	Poor battery performance Misleading and deceptive conduct	This class action was settled through a 'Cash payment of an additional \$100.00 to each Subclass Member...certifying dissatisfaction with the performance of the IMA battery or the Software Update', 'Reimbursement of Full Cost of Parts and Labour' to persons who had their IMA battery replaced in the 2003 through 2006 models and a 'Warranty Extension.' <sup>22</sup>

<sup>19</sup> Andy Palmer (Executive Vice President, Nissan Motor Co Ltd) "Special announcement regarding the Nissan LEAF" on *MyNissanLeaf* (22 September 2012) <http://www.mynissanleaf.com/viewtopic.php?uid=206&f=4&t=11043&start=0>; Jeff Cobb, *How Long Will An Electric Car's Battery Last?* (30 April 2014) HybridCars <http://www.hybridcars.com/how-long-will-an-evs-battery-last/>

<sup>20</sup> Helene Courtemanche and Honda Canada Inc, *Canadian 2003 – 2009 Honda Civic Hybrid Fuel Economy National Settlement Agreement* (13 August 2014) <http://www.hchsettlement.ca/SettlementAgreement>

<sup>22</sup> *Ibid*, p. 3

Case citation/s	Product	Facts	Issues	Outcome
		disclose material defects in the IMA Battery System and that when repaired would decrease the fuel efficiency of the HCH. <sup>21</sup>		
<i>Brown v Swagway, LLC and Modell's Sporting Goods, Inc.</i> , (Filed 10/12/15) USDC Northern District of Indiana	Hoverboard battery	<p>The plaintiff in this case sued Swagway LLC, the hoverboard manufacturer, and Modell's Sporting Goods Inc, the retailer, after the battery in his hoverboard exploded whilst charging. The explosion completely destroyed the hoverboard and allegedly caused a fire which substantially damaged parts of the plaintiff's home.<sup>23</sup></p> <p>He alleged that the Swagway Hoverboard was 'unsafe for its intended use... as it is defective and presents a material likelihood that it will self-combust or short-circuit while charging, leading to fire and/other damage.'<sup>24</sup></p>	Safety defect Total product failure	Case still pending
<i>Ramirez v Samsung Electronics America Inc.</i> , (Filed 8/9/16) USDC New Jersey, Newark District	Mobile phone battery	<p>The plaintiff brought an action against Samsung Electronics America Inc. and Samsung Electronics Co. Ltd. after his two month old Verizon Samsung Galaxy Edge S7 mobile phone overheated and exploded in his trouser pocket. The plaintiff had placed the phone in the front pocket of his trousers before, a short while later, he heard a high pitched whistling sound and saw smoke rising from the pocket.</p> <p>The lithium-ion battery in the phone then exploded, causing the plaintiff's trousers and legs to catch fire and inflicting</p>	Safety defect Total product failure	Case still pending

<sup>21</sup> *Helene Courtemanche v Honda Motor Co, Ltd, and Honda Canada Inc* [2014] QCCS 500-06-000601-126 (4 November 2014), available at: [http://www.hchsettlement.ca/Content/civic-hybrid-settlement-claims.ca/dbbe2b94-a97b-4336-b961-0bb93d225dfa/GenericContent\\_FFH/NEW-FINAL---Nov.-4-2014-Judgment---Motion-to-Authorize-the-Class-Action-Settlement-Agreement.pdf](http://www.hchsettlement.ca/Content/civic-hybrid-settlement-claims.ca/dbbe2b94-a97b-4336-b961-0bb93d225dfa/GenericContent_FFH/NEW-FINAL---Nov.-4-2014-Judgment---Motion-to-Authorize-the-Class-Action-Settlement-Agreement.pdf)

<sup>23</sup> James Eng, "Man Sues Hoverboard Maker Swagway Over Fire That Damaged His Home", *NBC News* (online), 16 December 2015, <http://www.nbcnews.com/news/us-news/man-sues-hoverboard-maker-swagway-over-fire-damaged-his-home-n481336>

<sup>24</sup> Alexis Kellert, *Hoverboard Liability Suits Could Float To Top In 2016* (28 January 2016) Law360 <https://www.law360.com/articles/750243/hoverboard-liability-suits-could-float-to-the-top-in-2016>; *Brown v Swagway, LLC and Modell's Sporting Goods, Inc.* (Filed 10/12/15) USDC Northern District of Indiana, USDC IN/ND, No. 3:15-cv-588-RL-CAN at 20, [https://s3.amazonaws.com/pacer-documents/N.D.%20Ind.%2015-cv-00588%20dckt%20000001\\_000%20filed%202015-12-10.pdf](https://s3.amazonaws.com/pacer-documents/N.D.%20Ind.%2015-cv-00588%20dckt%20000001_000%20filed%202015-12-10.pdf)



Case citation/s	Product	Facts	Issues	Outcome
		<p>second and third degree burns on his legs, groin, lower back and hands (when he tried to remove the phone).<sup>25</sup> The phone itself was left ‘completely charred and destroyed’. The plaintiff sought compensatory and punitive damages based on the manufacturer’s negligence, strict liability, breach of implied warranty and noncompliance with the New Jersey Consumer Fraud Act.<sup>26</sup> In particular, he alleged that the phone was “manufactured, designed, tested, assembled, imported, distributed and/or sold in an unreasonably safe, suitable, fit, dangerous and defective condition, such that the cell phone had an unreasonable propensity to explode during normal and foreseeable conditions.”<sup>27</sup></p> <p>In August 2016, Samsung postponed rolling out all new mobile phones in response to emerging reports on social media of other similar incidents occurring. In September, Samsung issued a global recall of over 2.5 million Samsung Galaxy Note7 phones.<sup>28</sup></p>		
<i>Waudby, Spuntak and Ibrahim v Samsung Electronics America, Inc.</i> , (Filed 16/10/16) USDC New Jersey, Newark District	Mobile phone battery	Three plaintiffs brought a class action against Samsung Electronics America Inc. on behalf of “all others similarly situated” – that is, all consumers in the United States who had purchased a Samsung Galaxy Note7 smartphone prior to the recall. Rather than suing Samsung for any damage caused by exploding smartphones, the	<p>Safety defect Breach of express warranty</p> <p>Common law fraud</p> <p>Breach of the duty / implied covenant of good faith and fair dealing</p>	Case still pending

<sup>25</sup> Lexis Legal News, *California Man Files Product Defect Suit over Exploding Samsung Phone* (22 September 2016) <http://www.lexislegalnews.com/articles/11375/california-man-files-product-defect-suit-over-exploding-samsung-phone>

<sup>26</sup> Ibid.

<sup>27</sup> Daniel Ramirez, *Complaint filed in the Superior Court of New Jersey Bergen County* (8 September 2016) <https://www.classaction.com/wp-content/uploads/sites/33/2016/09/Samsung-PDF.pdf>

<sup>28</sup> Mike Wurerthele, *Samsung stops shipments of ‘exploding’ Galaxy Note 7 Phones* (31 August 2016) APPLEINSIDER <http://appleinsider.com/articles/16/08/31/samsung-stops-shipments-of-exploding-galaxy-note-7-phones> ; Clare Reilly, *Samsung Recalls Galaxy Note 7 Over Battery Flaw* (2 September 2016) CNET <https://www.cnet.com/au/news/samsung-confirms-global-recall-replacement-galaxy-note-7-faulty-battery/>

Case citation/s	Product	Facts	Issues	Outcome
		<p>plaintiffs and the class sought compensation for the financial loss they suffered as a result of Samsung's recall. After Samsung advised those who had purchased the phones to immediately discontinue use and exchange them, it had eventuated that insufficient phones were actually available for immediate replacement. As a result, many consumers were forced to wait days or weeks for a replacement, whilst continuing to incur fees (e.g. for their cell phone plans) despite their phones being out of use.<sup>29</sup> Accordingly, damages were sought for Samsung's breach of express warranty, breach of good faith and fair dealing, and common law fraud (in respect of conscious misstatements and omissions made by Samsung concerning the replacement of Galaxy Note7s)<sup>30</sup></p>		
<p><i>Shaheen and Fuller v Samsung Canada and Samsung USA</i> [2016] Ontario Superior Court</p>	<p>Mobile phone battery</p>	<p>Two Canadian plaintiffs (a newlywed couple) brought a class action against both the American and Canadian divisions of Samsung after they were forced to destroy their recently purchased Samsung Galaxy Note7 smartphones before boarding a flight to the USA from the Turks and Caicos Islands. The couple were returning from their honeymoon. At this stage, Samsung had just issued its recall of the smartphones, which were banned from air transportation due to the fire hazard posed by their defective batteries. Furthermore, whilst the plaintiffs were attempting to destroy their phones, one allegedly caught fire. The plaintiffs sought compensation for loss of the phones, alleging that the defendants were negligent</p>	<p>Safety defect</p>	<p>Case still pending</p>

<sup>29</sup> Abinaya Vijayaraghavan, *Samsung faces potential class action in U.S. over Note 7* (18 November 2016) Thomson Reuters <http://www.reuters.com/article/us-samsung-elec-smartphones-class-action-idUSKCN12I2TY>

<sup>30</sup> John Wauby, Robert Spuntak and Mohamad Ibranhim, *Complaint filed in the US District Court for the District of New Jersey Newark Division* (16 October 2016) [http://online.wsj.com/public/resources/documents/2016\\_1017\\_samsung\\_lawsuit.pdf](http://online.wsj.com/public/resources/documents/2016_1017_samsung_lawsuit.pdf)

Case citation/s	Product	Facts	Issues	Outcome
		because they knew or should have known the devices were defective and could harm consumers. <sup>31</sup>		
South Korean class action against Samsung Korea for the Galaxy 7	Mobile phone battery	527 Galaxy Note 7 owners filed a class action against Samsung in South Korea, seeking 500,000 won (around \$US440) apiece in compensation for inconvenience, financial loss and anxiety suffered after the devices were discontinued and recalled. <sup>32</sup> Plaintiffs complained of having to revisit stores multiple times to have their batteries checked and replacements sourced, before ultimately having to exchange their replacement Note7s for other smartphones entirely (following reports that even the replacement phones were experiencing similar problems with battery overheating). Brought by a local law firm after similar actions were initiated in Canada and the United States, this was the first Note7-related lawsuit to be brought in South Korea. <sup>33</sup>	Safety defect.	Case still pending

The conclusion that may be drawn from studying some of the previous case law involving battery litigation is that there are likely to be five common problems arise with the use of residential battery storage systems:

1. **Poor battery performance:** While the diminishing ability to fully charge/discharge is a fundamental feature of lithium ion batteries, poor battery performance commonly takes the form of unacceptable or unusually accelerated battery capacity degradation over time, which affects the maximum charge that the end-customer can get from their battery.
2. **Poor battery life:** The battery needing to be charged more frequently over time which may negatively affect the end use of the product, e.g., when coupled with poor battery

<sup>31</sup> Alexandra Posadzki, *Class-action lawsuit over Galaxy Note 7 smartphones filed in Canada* (7 November 2016) The Star <https://www.thestar.com/business/2016/11/07/class-action-lawsuit-filed-against-samsung-in-canada-over-note-7-smartphones.html>

<sup>32</sup> IANS, *Galaxy Note 7 owners in South Korea file class-action lawsuit against Samsung* (24 October 2016) BGR Media <http://www.bgr.in/news/galaxy-note-7-owners-in-south-korea-file-class-action-lawsuit-against-samsung/>; Xinhua News Agency, *Hundreds of Samsung Note 7 Owners in South Korea file class action lawsuit* (24 October 2016) Xinhuanet [http://news.xinhuanet.com/english/2016-10/24/c\\_135777532.htm](http://news.xinhuanet.com/english/2016-10/24/c_135777532.htm)

<sup>33</sup> Ibid.

performance this may mean that an electric vehicle owner is no longer able to get the same driving range out of their vehicle before having to recharge the battery.

3. **Total product failure:** The battery no longer works.
4. **Safety defects:** Batteries have been the subject of a number of international recalls in recent years, with common problems including electrical malfunction, overheating, fire risk, the risk of electric shocks and battery leakage, as well as any consequential personal injury, property damage or economic loss resulting from safety defects. This problem is particularly serious in the context of lithium ion batteries. While the likelihood of a fire as a result of a single battery may be relatively low, the risk of such an event is foreseeable, especially given the experience of other international jurisdictions such as Germany. A German industry expert, Wilfried Schulz, stated at the IRENA Expert Workshop on the Regulation of Energy Storage that he was aware of at least eight house fires caused by lithium ion energy storage devices in Germany.<sup>34</sup> Further, there was also a fire caused by a faulty energy storage system at a residential property in Victoria in 2016.<sup>35</sup> The gravity of a fire event resulting from a malfunctioning battery on a residential household warrants that additional measures should be adopted to prevent the loss of life, personal injury and property damage.
5. **Misleading and deceptive conduct:** These cases involve false claims being made by the seller of the product to the end purchaser. In the context of battery litigation, these claims may relate to promises about the total lifespan of the battery, the frequency with which it will need to be charged, the usable battery capacity, or other claims about appropriate uses for, or the safety of the product. In particular, the lack of realistic data on the technical performance of residential battery storage systems over their working life when operated under normal (not optimal laboratory) conditions means it is difficult for consumers to conduct their own research or make informed decisions about the likely costs of a residential battery storage system over its life. In particular, there has been criticism that some of the available data does not include operating, maintenance, decommissioning or recycling costs. In these circumstances, should a seller make a claim to a potential purchaser about the amount that they will save by installing the residential battery storage system or its total cost which later proves to be false, the purchaser may have a valid claim under the applicable consumer protection legislation.

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<sup>34</sup> Discussion and follow up personal email.

<sup>35</sup> Giles Parkinson, "Fire sparks concerns over lack of standards on battery storage," (18 March 2016) <http://reneweconomy.com.au/fire-sparks-concerns-over-lack-of-standards-on-battery-storage-52193/>

Such problems may give rise to consumers bringing claims against the manufacturers, suppliers and retailers of residential battery storage systems for a breach of their contractual warranty, breaches of the statutory consumer guarantees, claims in tort for personal injury, property damage and economic loss, or under consumer protection laws for misleading and deceptive conduct.

## 1.1 Characteristics of the Australian market that are causing challenges for international products entering the market

In addition to the likely problems that will be experienced in relation to residential battery storage systems globally, the Australian market also poses some unique challenges for market entrants.

**Environmental challenges:** Many areas of Australia are subject to extreme temperatures in excess of 40°C (or 104°F) in summer, and these hot days may persist for several days consecutively. Further, some areas of Australia are prone to extended periods of high humidity, particularly in the summer months. Both high temperatures and high humidity are known to cause problems for lithium ion batteries, shortening their lifespan and reducing their performance.<sup>36</sup> As a result, battery manufacturers have placed limitations on both upper maximum and minimum ambient and operating temperatures and humidity for their batteries. As discussed below, most warranties are voided if the battery is exposed to temperatures or humidity outside these ranges either on a one-off basis or in the case of some batteries, when averaged over a 12-month period.

**The lack of applicable product standards:** There are currently no Australian Standards governing residential battery storage system safety, installation or performance.<sup>37</sup> These Standards are currently in the process of being drafted but have been identified as a high priority area for the development of Standards since 2012. However, even if these Standards are adopted, experience from other electrical products, which have adopted Australian Standards over a widely used international standard, suggests they could potentially have a detrimental impact on consumers within the Australian market by limiting the range of available products able to enter the market. This in turn, could have a negative affect on competition and the prices paid by Australian consumers. That said, while some applicable international standards do exist and are beginning to be used within the Australian market such as IEC62619<sup>38</sup>, these standards are still yet to be widely adopted.

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<sup>36</sup> See, for example: Ovidiu Sandru, *Nissan Leaf Lawsuit: New Battery Replacement for Unhappy Customers* (21 July 2015) The Green Optimistic <https://www.greenoptimistic.com/nissan-leaf-lawsuit-battery/>; Jeff Cobb, *How Long Will An Electric Car's Battery Last?* (30 April 2014) Hybrid Cars <http://www.hybridcars.com/how-long-will-an-eva-battery-last/> (Nissan and Tesla have similarly experienced problems with consumers using lithium batteries for electric cars in warm climates, whereby the batteries charging to 100% can cause them to overheat and become permanently damaged).

<sup>37</sup> K. Cavanagh, S. Behrens, C. Price, O. Lim, N. Haigh, A. Fleming, E. Oliver, A. Mankad, and A. Bhatt, "Energy storage safety: Responsible installation, use and disposal of domestic and small commercial battery systems" (2015) *CSIRO Report EP156209*, Clean Energy Council, Australia.

<sup>38</sup> DNVGL, *Lithium batteries – Rules and Standards* (December 2015) DNVGL-CP-0418 <https://rules.dnvgl.com/docs/pdf/DNVGL/CP/2015-12/DNVGL-CP-0418.pdf>

So what consumer protections exist to protect consumers in the event of problems with their residential battery storage system?

## 2. The protection offered by contractual warranties

Parisi has defined a warranty as “a promise by the seller to assume specific responsibilities in case the quality or performance of the purchased item does not conform to its specifications or to the buyer’s legitimate expectations.”<sup>39</sup> A number of different theories for having contractual warranties can be identified from the literature including:

### 2.1 Insurance theory<sup>40</sup>

Insurance theory suggests that contractual warranties for the residential battery storage system will operate to allocate the potential risks between the manufacturer/retailer and the purchaser on the basis of who is best able to manage or mitigate the risk. Given the product complexity and significant information asymmetries present in the market for residential battery storage systems, this theory supports the notion that the manufacturers/retailers ought to assume the full costs of refunding, repairing, or replacing a faulty product that fails within the warranty period. Thus according to this theory, the presence of a contractual warranty provides added value to individual purchasers, who are generally assumed to be risk averse, because it insures them against these risks.

However, as will be shown later in this report, in the context of residential battery storage systems almost all of the shared risks seem to be passed onto the purchaser of the storage system to the fullest extent that the manufacturers/retailer can do so. Given the lack of secondary insurance products currently available on the market, and the challenges that purchasers of residential battery storage systems have with information asymmetries when compared to the manufacturers/retailers of such systems, this often leaves the purchaser carrying risks that they are not best placed to manage.

### 2.2 Incentive theory<sup>41</sup>

A theory related to the insurance theory, as the rationale for providing contractual warranties, is the incentive theory. Incentive theory operates on the assumption that, as manufacturers are bearing the risk of their product failing under the insurance theory, thereby creating a contingent liability,

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<sup>39</sup> Francesco Parisi, “The Harmonisation of Legal Warranties in European Sales Law” (Spring 2004) 52 *American Journal of Comparative Law* 403-430.

<sup>40</sup> See, for example, the work of Geoffrey Heal (1976) “The Demand for Products of Uncertain Quality”, in *Equilibrium and Disequilibrium in Economic Theory*, G. Schwodiauer, ed. Dordrecht, Holland: Reidel Corporation, 38-51; (1977) “Guarantees and Risk Sharing” 44(3) *Review of Economic Studies* 549-60.

<sup>41</sup> See, for example: Russell Cooper and Thomas W. Ross, “Product Warranties and Double Moral Hazard” (1985) 52(3) *RAND Journal of Economics* 103 – 113; Nancy A. Lutz, “Warranties as Signals Under Consumer Moral Hazard” (1989) 20(2) *RAND Journal of Economics* 239 – 55; Nancy A. Lutz and V. Padmanabhan, “Why Do We Observe Minimal Warranties?” 14(4) *Marketing Science* 417 – 67; G. Priest, “A Theory of the Consumer Product Warranty” 90(6) *Yale Law Journal* 1297 – 1352.



this in turn creates an incentive for manufacturers to invest in their product quality so as to minimise their future losses. Given the history of battery warranty litigation, this theory suggests that manufacturers of residential battery storage systems should invest in their product quality so as to minimise the risk of warranty claims (and any associated litigation). While some manufacturers appear to have adopted this approach, many manufacturers have instead sought to minimise their liability by imposing onerous conditions and exclusions on their contractual warranties and relying on purchasers not reading their warranty contracts prior to purchase.

### 2.3 Market signalling theory<sup>42</sup>

Market signalling theory suggests that warranties are important because consumers have imperfect information<sup>43</sup> and thus struggle to assess the quality, performance and reliability of a residential energy storage system prior to purchase. In providing a warranty, the manufacturer/retailer uses the warranty as a proxy to send a signal to the consumer about the inherent quality, performance and reliability of their product by suggesting that the risk of poor product performance or product failure is low. Joseph Stiglitz has argued that the use of warranties in this way can also lead to the accelerated adoption of new products, such as residential battery storage systems, as they reduce the risks perceived by the purchaser.<sup>44</sup> This seems to be the case even when we know anecdotally that many purchasers do not read their warranty contracts and instead rely on the seller to provide them of a summary of the warranty offering (which may or may not be accurate). Indeed, a survey by the U.S. Department of Commerce conducted in 1992 found that one in two consumers used warranties to judge product quality when making a purchase decision.<sup>45</sup> Thus while contractual warranties are not the sole signal about product quality, it does mean that they operate as a persuasive sales variable.<sup>46</sup> It also highlights the importance of purchasers understanding what the warranty contract actually states rather than relying on the seller's marketing pitch on the warranty, which will almost invariably fail to mention the warranty conditions, limitations and exclusions.

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<sup>42</sup> See, for example: S. Balachander, "Warranty Signalling and Reputation" (2001) 47(9) *Management Science* 1282 – 89; Leon Courville and Warren H Hausman, "Warranty Scope and Reliability Under Imperfect Information and Alternative Market Structures" (1979) 52(3) *Journal of Business* 361 – 78; Esther Gal-Or, "Warranties as a Signal of Quality" (1989) 22(1) *Canadian Journal of Economics* 50 – 61; Sanford J. Grossman, "The Informational Role of Warranties and Private Disclosure About Product Quality" (1981) 24(3) *Journal of Law and Economics* 461 – 83; Michael Spence, "Consumer Misperceptions, Product Failure and Producer Liability" (1977) 44(3) *Review of Economic Studies* 561 – 72; Nancy A. Lutz, "Warranties as Signals Under Consumer Moral Hazard" (1989) 20(2) *RAND Journal of Economics* 239 – 55.

<sup>43</sup> See Joseph E. Stiglitz, "Imperfect Information in the Product Market" in R. Schmalensee and R. Willig (eds) *Handbook of Industrial Organisation* (Elsevier, 1989) 89 – 847.

<sup>44</sup> *Ibid.*

<sup>45</sup> United States Department of Commerce, *Product Warranties and Servicing: Responsive Business Approach to Consumer Needs* (1992) Washington D.C., 1.

<sup>46</sup> C.L. Kendall and Frederick A. Russ, "Warranty and Complaint Policies: An Opportunity for Marketing Management" (April 1975) 39 *Journal of Marketing* 36 – 43.

## 2.4 Sorting theory<sup>47</sup>

Consumers are not homogenous, especially not in their perceptions of quality and the associated levels of risk aversion. However, these individual consumer perceptions may not be easily discernible to manufacturers and retailers and thus previous research has highlighted that warranties can play an important role in segmenting the market for high-end consumer goods. In particular, sorting theory suggests that when choosing between competing products, purchasers who are risk averse may seek to buy a residential energy storage system that offers a longer warranty period, or better warranty coverage. Alternatively, consumers may be able to purchase an identical residential energy storage system but then choose to pay more to get an extended warranty period or enhanced warranty protections.

In the context of the Australian residential energy storage market, it appears that the major role of contractual warranties is to act as a persuasive marketing tool to signal product quality, performance and reliability.<sup>48</sup> Further, they also appear to provide purchasers with a limited degree of insurance against products failure.

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<sup>47</sup> V. Padmanabhan and Ram C. Rao, "Warranty Policy and Extended Service Contracts: Theory and an Application to Automobiles" (1993) 12(3) *Marketing Science* 230 – 247; Yuji Kubo, "Quality Uncertainty and Guarantee: A Case of Strategic Market Segmentation by a Monopolist" (1986) 30(5) *European Economic Review* 1063 – 1097; Steven Matthews and John Moore, "Monopoly Provision and Quality and Warranties: An Exploration in the Theory of Multidimensional Screening" (1987) 55(2) *Econometrica* 441 – 67.

<sup>48</sup> S. Balachander, "Warranty Signalling and Reputation" (2001) 47(9) *Management Science* 1282 – 89; Leon Courville and Warren H. Hausman, "Warranty Scope and Reliability Under Imperfect Information and Alternative Market Structures" (1979) 52(3) *Journal of Business* 361 – 78; Esther Gal-Or, "Warranties as a Signal of Quality" (1989) 22(1) *Canadian Journal of Economics* 50 – 61; Sanford J. Grossman, "The Informational Role of Warranties and Private Disclosure About Product Quality" (1981) 24(3) *Journal of Law and Economics* 461 – 83; Michael Spence, "Consumer Misperceptions, Product Failure and Producer Liability" (1977) 44(3) *Review of Economic Studies* 561 – 72; Nancy A. Lutz, "Warranties as Signals Under Consumer Moral Hazard" (1989) 20(2) *RAND Journal of Economics* 239 – 55.

### **3. Critical analysis of the contractual warranties offered to purchasers of residential battery storage systems in the Australian market**

This research has analysed the warranties offered by 14 different manufacturers covering 31 residential battery storage systems that are available in the Australian market. These warranties were collected from a variety of sources including from the websites of manufacturers, suppliers and retailers; from solar and storage comparator websites such as Solarquotes.com.au; and via a direct collection process from manufacturers and suppliers. These contractual warranties were analysed for a number of key discriminators, including the duration of the warranty, coverage of the warranty, warranty conditions, warranty exclusions, the available remedies under the warranty, and whether transfer of the warranty was permitted to a subsequent owner of the energy storage system. This analysis further examined what the relevant governing law of the warranty was, whether the warranty document acknowledged the existence of statutory rights under the Australian Consumer Law ('ACL'), and whether there were limitations placed on the application of the ACL, common law or other statutory rights or damages. Each of these discriminators was also compared to some of the product features of the battery such as the battery chemistry, total and usable battery capacity, depth of discharge, operating and ambient temperatures the system can be subjected to and whether the product was stated to comply with international standards. The results from this research have been evaluated to identify what the current market standard is within the Australian residential energy storage market and to identify best practice.

The individual results of this analysis are organised by manufacturer in Appendix 1.

### 3.1 Product features of residential battery storage systems

#### 3.1.1 Battery chemistry

The residential battery storage systems studied in this research were predominantly lithium ion batteries, reflecting the mix of batteries commonly used in such systems in the Australian market. While the term “lithium ion” is often used as a generic descriptor, the battery chemistries can vary considerably. Of the 31 systems studied, 19 batteries used lithium iron phosphate ( $\text{LiFePO}_4$ ) as their active materials, 6 used lithium nickel manganese cobalt oxide ( $\text{LiNiMnCoO}_2$ , also commonly referred to as ‘NMC’ within the sector), 2 used lithium manganese oxide ( $\text{LiMn}_2\text{O}_4$ ), while one battery was a zinc bromide ( $\text{ZnBr}_2$ , also commonly referred to as ‘ZBM’ within the sector) flow battery.

#### 3.1.2 Total and nominal battery capacity

Their battery sizes also ranged from having a total capacity of 1.2kWh for the Enphase Energy AC Batteries, in the context of a singular modular battery that was designed to be used in a scalable system, to 16kWh, for the sonnenBatteries. All but four of the batteries stated that their usable capacity was less than their advertised total capacity, which is something for consumers to be aware of when making purchasing decisions.

#### 3.1.3 Depth of discharge and cycle life

Most batteries experience battery capacity degradation over the lifespan of the battery, this means that over time as a battery gets charged and discharged their ability to effectively store energy reduces.<sup>49</sup> As a result, two critical features of any residential energy storage system are going to be the depth of discharge, which ‘describes the degree to which a battery is emptied relative to its total capacity,’<sup>50</sup> and the number of discharge/recharge cycles. These are often represented as [X] number of cycles at [Y]% depth of discharge. Out of the batteries studied in this research, the leading battery in the Australian residential energy storage market in terms of depth of discharge and cycle life is the sonnenBatterie, which claims to have a cycle life of 10,000 cycles at 100% depth of discharge. At the other end of the scale are the E-KwBeNC/S batteries from GCL Systems, which only claim to have a cycle life of 2,555 cycles at 100% depth of discharge. However, these figures need to be checked closely as some manufacturers advertise their battery life cycles using lower rates for the depth of discharge, with three manufacturers using rates as low as 80% for their depth of discharge, which should extend the nominal cycle life of the battery. This makes the act of

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<sup>49</sup> Isidor Buchmann, *BU-802: What Causes Capacity Loss?* (3 July 2016) Battery University [http://batteryuniversity.com/learn/article/capacity\\_loss](http://batteryuniversity.com/learn/article/capacity_loss)

<sup>50</sup> James Martin II, *Why depth of discharge matters in solar battery storage system selection* (23 November 2016) Solar Choice <https://www.solarchoice.net.au/blog/depth-of-discharge-for-solar-battery-storage>

comparing the technical data specifications supplied by manufacturers difficult for consumers. This is made more difficult due to the lack of independently verified comparisons available for the batteries sold into the Australian market.

### **3.1.4 Climatic conditions for the operation and storage of the battery**

As explained above, a particular concern in the context of the Australian residential energy storage market is whether the systems currently being imported into the Australian market are fit for purpose given the challenging climatic conditions. There are currently batteries being sold into the commercial storage market in Australia whose warranties will be voided if the average annual ambient temperature surrounding the battery is 26°C or more. This is because batteries operate less efficiently in high heat and humidity, thereby reducing their lifespan. Given that some areas of Sydney already have a record highest annual mean daily temperature of over 25.4°C, this is likely to be a growing problem for consumers, especially those in Central and Northern Australia. Indeed, many market participants have noted that this is a particular problem that they face in trying to find suitable commercial energy storage systems.

In the context of the residential battery storage systems, every manufacturer specified temperature ranges in either their operating manual or their warranty document. While the residential battery storage systems studied had wider temperature ranges than some of the commercial systems that are available, there was still significant variability as shown in Table 2 (below). For example the range of minimum operating temperatures varied by some 35°C (from -20°C to 15°C) depending on the manufacturer, while the maximum operating temperature also varied considerably between 35°C<sup>51</sup> and 65°C. Some manufacturers also specified a humidity range. If a consumer operates their residential energy storage system outside of these ranges, or stores the system in ambient temperatures higher than the permissible range then in the majority of cases this will void the warranty. Alternatively, the warranty period for battery capacity may be reduced, for example, if you use the SimpliPhi Power batteries in temperatures between 43.1oC and 49oC, your warranted battery cycle life is halved.

A further concern in this respect is that some manufacturers are advertising wider temperature ranges in their technical data specification sheets than in their warranty documents, which may

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<sup>51</sup> A temperature that would be challenging in the Australian context, with Sydney's temperature already exceeding 35°C on more than 9 occasions already in 2017: Raveen Hunjan, "Summer heat records smashed in Sydney and regional NSW", ABC News (online), 31 January 2017 <http://www.abc.net.au/news/2017-01-31/hottest-summer-ever-and-it-is-only-january/8225840>.

mislead or deceive consumers into believing that some systems are suitable for their purposes when in fact they are not.

**Table 2: Climatic conditions for residential energy storage system by battery manufacturer/ supplier**

<b>Battery manufacturer/supplier</b>	<b>Min operating temp. (°C)</b>	<b>Max operating temp. (°C)</b>	<b>Min ambient temp. (°C)</b>	<b>Max ambient temp.</b>	<b>Humidity</b>
BYD Lithium Battery Co. Ltd	0	50	-10	40	-
Deep Cycle Systems Pty Ltd	-5	65	-20	65	-
Enphase Energy, Inc	-	Note that different capacity warranties are applicable depending on whether the average annual internal AC Battery temperature is below 28°C or between 28°C and 37°C.	-	Average internal temp. must not exceed 37oC in any one year period.  Ambient temp. cannot exceed 55oC for 24 hours or more.  Ambient temp. cannot exceed 60oC for 1 hour.  Ambient temp. of 70oC at any time.	-
Fronius	5	35	-40	65	95% (non condensing)
GCL Systems Integration Technology Co., Ltd	0	45	-	50	25 – 95%
LG Chem, Ltd	-10	45	-	-	-

Battery manufacturer/supplier	Min operating temp. (°C)	Max operating temp. (°C)	Min ambient temp. (°C)	Max ambient temp.	Humidity
Pylon Tech	-10	50	-	-	-
Redflow	15	50	-	-	-
Samsung SDI	-10	40	-20	60	95% (non condensing)
SimpliPhi Power, Inc	-50 for 5000 cycles 0 for 10,000 cycles	49 for 5000 cycles 43 for 10,000	-	-	
Sonnen Australia Pty Ltd	5	40	-	-	-
Sunverge Energy Australia Pty Ltd	-20	50	-	-	-
Tesla Motors Netherlands B.V.	-20	50	-30	60	Up to 100% (condensing)
TrinaBEST	0	40	-	50	-

**Key questions for consumers about whether the battery is fit for purpose for their climatic conditions**

What are the minimum, average and maximum ambient temperatures in the area in which I am proposing to install the battery?

What are the minimum, average and maximum operating temperatures likely to be in the area in which I am proposing to install the battery?

Will I need to take steps such as using installation or automatic shutdown to prevent the residential energy storage system being exposed to extremes of temperature or humidity that would void or limit my warranty?

Are there other requirements such as the need for ventilation or the draft Australian Standard, which requires installation on the exterior of a property, which may not only limit where I can physically site my battery system but may also impact on the local climate to which the system is exposed?

### 3.2 Warranty period

Most of the batteries studied had a warranty document that had been drafted in the past 12 months, suggesting that this is an area of rapid change. Amongst the warranties studied, the market standard for the warranty period was 10 years for a limited warranty. Consumers need to be careful though about the date that the warranty period starts from. As shown in Table 3 below, there is a divergence of practice amongst the sector with different manufacturers/ suppliers commencing their warranty period on:

- the date of manufacture;
- the date of invoice;
- the date of dispatch from the factory;
- the date of delivery;
- the date 6 months from the date of manufacture of the battery;
- the date of installation; or
- the date of system registration.

These differing start dates may significantly affect the length of the warranty period. If the warranty period runs from the date of manufacture, date of invoice, date of dispatch from the factory, date of delivery or even 6 months from the date of manufacture of the battery, all of these could be several months before the system is installed and able to be enjoyed by the consumer. It also passes the risk of a delay in transportation between a foreign factory and the Australian installer onto the end consumer, who is not in a position to be able to mitigate or manage this risk but who nonetheless remains out of pocket for the system, which they have paid for, and also suffers from a diminishing warranty period. Consumers thus need to ensure that they find out the applicable lead times from their battery manufacturer, supplier and installer and where possible, should not agree to the warranty period starting on any date other than the date of installation or system registration.

There are two further issues with the warranty period for residential battery storage systems that consumers need to be aware of. First, they need to check if the warranty period only applies to the battery or whether it applies to all of the components of the residential energy storage system. Often, other embedded componentry within the system may have different applicable warranty periods, which is something to consider prior to purchase. Secondly, consumers need to consider how they are likely to use the residential energy storage system in light of their domestic energy generation and usage profile and then check to see whether that its likely to affect the discharge/recharge cycle of the battery. As shown in Table 3, a number of manufacturers will end the warranty period early once a specified number of cycles (either complete discharge cycles or



pro-rated) or specified amount of energy has been delivered. Depending on the likely usage pattern of the battery, this could have a significant impact on the length of the warranty available to the consumer.

**Table 3: The warranty period and applicable start date by battery manufacturer/supplier**

<b>Battery manufacturer/supplier</b>	<b>Length of warranty for battery</b>	<b>Start date</b>
BYD Lithium Battery Co. Ltd	10 years	Date of invoice
Deep Cycle Systems Pty Ltd	10 years	Date of invoice
Enphase Energy, Inc	10 years or 7,3000 fully discharged cycles (whichever is earlier)	Earlier of 6 months from the date of manufacture <u>OR</u> the date of installation
Fronius	2 years (if product registered online with Fronius and have a regular internet connection, warranty period can be extended to 5 years for the defects warranty and a 15 year capacity guarantee)  Warranty extensions also available for purchase from installers.	Date of dispatch from the Fronius factory  Note: inconsistent end date – which is 2 years or 15 years after the purchase date.
GCL Systems Integration Technology Co., Ltd	7 years	Date of invoice
LG Chem, Ltd	10 years	Date of installation
Pylon Tech	5 years (if unregistered) 10 years (if registered)	Earlier of 6 months from the date of manufacture <u>OR</u> the system registration date
Redflow	12 months (defects) 10 years or 36,5000 kWh of energy delivered, (whichever is earlier) (performance)	Date of delivery

<b>Battery manufacturer/supplier</b>	<b>Length of warranty for battery</b>	<b>Start date</b>
Samsung SDI	5 years	Date of installation or if the customer cannot show proof of the date of installation then they will use the manufacturing date
SimpliPhi Power, Inc	10 years or 10,000 cycles (pro-rated) (whichever is earlier)	Date of purchase
Sonnen Australia Pty Ltd	10 years or 10,000 complete recharge cycles (whichever is earlier)	Date of installation
Sunverge Energy Australia Pty Ltd	10 years	Date of installation
Tesla Motors Netherlands B.V.	10 years	Date of installation
TrinaBEST	10 years or minimum energy throughput and capacity specifications (whichever is earlier)	Date of invoice

**Key questions for consumers when considering the warranty period**

What is the applicable warranty period?

Does the entirety of the battery storage system have the same warranty period or do different components have different warranty periods?

Does the warranty period run from the date of invoice or the date of installation or some other start date for the residential energy storage system?

What happens if there is a delay in installation outside of the customer's control?

What are the average market lead times between invoicing and installation?

What is the lead-time between manufacture, invoicing, factory dispatch and installation for your battery manufacturer/supplier?

If you charge and discharge your residential energy storage system more than once per day on average over the warranty period, does this lead to a reduction in the applicable warranty period?

### 3.3 Warranty coverage

A critical area for any analysis of the warranties offered for residential battery storage systems is what is actually covered by the warranty. Traditionally, the contractual warranties for lithium ion batteries did not cover any abnormal degradation of the battery capacity that might have affected the performance of the battery. Instead, they would generally cover defects in workmanship or materials that led to a total failure of the battery and would stipulate that the battery conformed to the specifications in the product datasheet. This was particularly problematic when manufacturers or suppliers would use terms in the warranty documents such as “defect” or “malfunction” that were not otherwise defined. When this happens, it leaves the manufacturer as a sole determiner of whether something meets its unpublished internal definition of "defective" or "malfunctioning".<sup>52</sup>

In recent years, the extent of the coverage of the warranties offered has begun to shift, with most manufacturers now providing a capacity warranty over the warranted life of the battery (sometimes also called the ‘performance warranty’).<sup>53</sup> As stated above, a feature of lithium ion batteries is that after repeated charge and discharge cycles, their ability to store energy diminishes over time.<sup>54</sup> As such, consumers should not expect that most batteries are capable of providing the same volume of energy storage at the end of the warranty period that they are able to store at the start of the warranty period.

Among the warranties studied there was variation in the amount of capacity, which the manufacturers/suppliers were willing to warrant retention of at the end of the warranty period. Deep Cycle Systems and Pylontech offered the best warranties in this regard promising that their batteries would retain at least 80% of their Nominal Energy for 10 years if they were used in accordance with their product manuals.<sup>55</sup> Enphase also provided a similar battery capacity retention warranty but only if the average annual internal temperature of the AC battery was below 28°C.<sup>56</sup> Redflow warranted the performance of their ZMB2 product for a period of 10 years but did not stipulate what the performance standard that they were using was in their warranty document.

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<sup>52</sup> Vired99, “Model S – Charging less already?” on *Tesla Motors Forum* (17 July 2013) <https://forums.teslamotors.com/forum/forums/model-s-charging-less-already>

<sup>53</sup> Melvin Eisenstadt, “Performance warranties for residential and light commercial PV systems” (Nov/Dec 1981) 3 *Solar Law Reporter* 607-658, 607. Also see, for example, the Powerwall’s 10 year, 3,650 cycle performance warrantee: Horan & Bird, *Battery Storage Systems are the way of the future* (2017) <http://www.horanandbird.com.au/solar/battery-storage-systems>

<sup>54</sup> Isidor Buchmann, *BU-802: What Causes Capacity Loss?* (3 July 2016) Battery University, [http://batteryuniversity.com/learn/article/capacity\\_loss](http://batteryuniversity.com/learn/article/capacity_loss)

<sup>55</sup> Deep Cycle Systems Pty Ltd, *Performance Warranty for the DCS PV Series energy storage units* (November 2016) SolarQuotes, p. 1, [http://www.solarquotes.com.au/blog/wp-content/uploads/2017/03/DCS-PV-Series\\_Warranty-1.pdf](http://www.solarquotes.com.au/blog/wp-content/uploads/2017/03/DCS-PV-Series_Warranty-1.pdf)

<sup>56</sup> Enphase Energy Inc, *AC Battery Limited Warranty – Australia and New Zealand* (1 August 2016) p. 2, <https://enphase.com/sites/default/files/AC-Battery-Limited-Warranty-AU-NZ.pdf>

Consumers considering purchasing a product with an unstated performance standard should always seek clarification of this point from the manufacturer/supplier in advance of purchasing their residential energy storage system. Fronius guaranteed a minimum capacity of 68% for the Sony battery module used in their residential energy storage system would be retained for “up to” 15 years, however the drafting of this warranty coverage clause was ambiguous with it not being clear what would happen if the battery failed shortly before the end of this capacity guarantee.<sup>57</sup> Other manufacturers would only warrant their batteries to significantly lower levels of capacity retention, with the worst capacity warranties only committing to the battery retaining 60% of its nominal capacity at the end of the warranty period. Note that for some of the capacity retention warranties to be maintained over the life of the product some manufacturers/suppliers such as DCS, GCL, Redflow and Samsung stipulate that the customers must exclusively use their authorised service agents or the original installer for service and maintenance.

A further issue that consumers need to be alive to is whether they can actually access their own data to see if their system is meeting the stipulated performance standard or not. This was raised as an issue in the context of electric vehicles in the NissanLEAF class actions.<sup>58</sup> In that case, consumers alleged that they were not advised of the applicable performance standard prior to purchasing the vehicle and then were unable to access their own data to see if their car battery was meeting the standard or not. A number of consumers took to installing a non-Nissan endorsed app using the USB portal in their cars as a means of recording and storing their battery performance data in order to be able to collect the data for themselves. This led to Nissan amending the warranty to state that the use of any non-Nissan app would void their warranty.<sup>59</sup> It is imperative that consumers be able to access their own data to assess whether it is appropriate to make a warranty claim in the context of poor capacity retention, especially as some manufacturers will charge consumers for transportation, investigation and servicing costs where the battery is found to be operating at an acceptable level.

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<sup>57</sup> Fronius, *Warranty Conditions for Fronius Inverters and the Fronius Datamanager* (1 January 2017) p.3, [http://www.fronius.com/cps/rde/xbcr/SID-706ACDA5-4E4F1C25/fronius\\_international/SE\\_TOW\\_EN\\_AU\\_55\\_0117\\_411519\\_snapshot.pdf](http://www.fronius.com/cps/rde/xbcr/SID-706ACDA5-4E4F1C25/fronius_international/SE_TOW_EN_AU_55_0117_411519_snapshot.pdf)

<sup>58</sup> Above n 18-19.

<sup>59</sup> Francesca Svarcas, “Turning a new LEAF: A privacy analysis of carwings and electric vehicle data collection and transmission” (2012) 29 *Santa Clara Computer & High Technology Law Journal* 165-197

**Key questions for consumers when considering the warranty coverage**

Is there a warranty for manufacturing defects, or poor workmanship?

Are there terms used in the warranty such as “defect” or “malfunction”, which are not specifically defined by the manufacturer?

Is there a warranty for excessive battery degradation, or premature loss of battery capacity?

If so, what counts as capacity, is it the total capacity of the battery or is it just the usable capacity of the battery?

Are the manufacturers performance standards publicly available prior to purchase?

Are consumers able to access their own data in order to show a failure of their battery to meet the manufacturers performance standards?

If there are no publicly available product standards prior to purchase, what does this mean for performance warranties?

Are there restrictions on who can service and maintain the battery in order for the capacity retention warranty to be maintained over the warranty period?

### 3.4 Warranty conditions

Any warranty claim will be subject to the consumer using their battery in accordance with the conditions specified in the warranty document. Standard conditions in the warranties studied included that:

- the battery is used normally and subject to the consumer meeting the conditions in the product installation and operation manual (including optimal operating temperatures and humidity levels);
- the battery be registered with the manufacturer (normally this includes providing proof of purchase and the date of installation);
- the consumer agree to using the telemetric system associated with the product and maintain a reliable internet connection (including making any software updates in a timely fashion);
- the battery be installed by an installer authorised by the manufacturer/supplier;
- the use and storage of the battery be subject to climatic limits (operating and ambient temperature and maximum humidity limits);
- the battery must have a legible and correct serial number;
- the inverter used in the residential energy storage system is contained on the a list of approved inverters by the battery manufacturer;
- in the event of a warranty claim, the consumer has a limited period of time in which to report the defect and file their claim in accordance with the specified procedure stated in the warranty document.

A number of manufacturers/suppliers also specify that the warranty will be voided if the battery is not installed within 12 months of the date of the battery manufacture. This is arguably not within the control of the individual consumer and thus this risk should not be passed to consumers in the warranty document.

Some of the more unusual, and arguably unreasonable, conditions placed on the warranties studied included:

- BYD Batteries: “The product can only be installed and operated in household energy storage applications with an average of one full cycle per day.”<sup>60</sup>

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<sup>60</sup> BYD Lithium Battery Co Ltd, *Warranty Letter for BYD Battery Box & Battery Plus (B-Box & B-Plus 2.5/ 5.0/ 7.5/ 10.0)* (14 December 2016) 360Energy, 4.8 [https://www.360energy.com.au/wp-content/uploads/2016/08/B-BOX\\_Product\\_Warranty\\_letter\\_20161214.pdf](https://www.360energy.com.au/wp-content/uploads/2016/08/B-BOX_Product_Warranty_letter_20161214.pdf)

- Pylontech: “Pylontech should be informed within 48 hours via email to calling [sic] in case of any products problems or defects that should be claimed for warranty.”<sup>61</sup>
- SimpliPhi Power: “In the event you rent or lease the SimpliPhi Power Product, no end-user purchase takes place; therefore, this Limited Warranty does not apply and you must contact your rental or leasing company to determine whether Warranty coverage is applicable.”<sup>62</sup>
- TrinaBest: “The Limited Warranty is conditional on the following [...] the battery is never discharged below 90% of its remaining capacity.”<sup>63</sup>

### Key questions for consumers when considering the warranty conditions

What conditions have to be met in order to invoke a warranty claim?

Is product registration required?

Is a reliable connection to the Internet for the residential energy storage system a warranty condition?

Do you have to agree to automatic software updates on the battery system?

Are their privacy concerns with the manufacturer using telematics systems to remotely collect data on an individual’s battery use management, battery charging history, battery deterioration, electrical system functioning and software version information?

Are there conditions on the use and maintenance of the battery system?

What is the applicable time period to notify the manufacturer/supplier of defects and file a claim?

<sup>61</sup> Pylon Technologies Co Ltd, *Lithium-Iron Phosphate Battery US2000B Product Manual* <http://www.s-power.cz/wp-content/uploads/pylontech-us2000b-manual.pdf>

<sup>62</sup> SimpliPhi Power, Inc, *10 Year Limited Warranty: PHI2.6, PHI3.4* (6 September 2016) DPA Solar, p. 2 [http://dpasolar.com.au/media/mconnect\\_uploadfiles/S/i/SimpliPhi%20Power%20Inc.%20Warranty.pdf](http://dpasolar.com.au/media/mconnect_uploadfiles/S/i/SimpliPhi%20Power%20Inc.%20Warranty.pdf)

<sup>63</sup> TrinaBEST, *Warranty: Energy Storage System for Home: PowerCube 2.0 – V1.3*, p. 1 [http://img.en25.com/Web/MPowerAustralia/%7Bb9fe278c-9859-4b37-bda7-9d286b228a3a%7D\\_TrinaBEST\\_Warranty\\_PowerCube\\_EN\\_V1.3.pdf](http://img.en25.com/Web/MPowerAustralia/%7Bb9fe278c-9859-4b37-bda7-9d286b228a3a%7D_TrinaBEST_Warranty_PowerCube_EN_V1.3.pdf)



### 3.5 Warranty exclusions

All of the warranties studied contained an extensive list of exclusions. Table 4 contains the common exclusions in battery warranties by manufacturer/supplier. This table highlights that common exclusions include:

- a failure to operate the battery in accordance with the installation/product manual;
- incorrect installation;
- misuse or abuse of the battery;
- negligence;
- the battery being subject to an unsuitable physical environment;
- the battery being subject to a force majeure event;
- the battery being subject to an electrical surge;
- unauthorised product modification;
- maintenance being carried out by an authorised repairer; or
- damage caused during shipping or transportation.

While mitigating or managing most of these exclusions is arguably within the remit of the consumer, some of these exclusions are better managed by the manufacturer, such as damage incurred in shipping or transportation prior to the system arriving at the end consumer. Another example where this occurs is in the BYD Battery warranty, which states that an exception to the warranty occurs for “Defects of Products arising due to technology update, or renewable of the national or regional laws or regulations,”<sup>64</sup> passing unnecessary risks onto consumers, which are outside of their control.

A further consideration for consumers seeking to use their residential energy storage system to go “off-grid” is that both Tesla and BYD explicitly exclude the use of their batteries for life-support systems, with BYD also prohibiting their battery from being used to assist with charging automotives. In particular, Tesla’s warranty states:<sup>65</sup>

“Your Powerwall is not intended for use as a primary or backup power source for life-support systems, other medical equipment, or any other use where product fate could lead to injury to persons or loss of life or catastrophic property damage. To the extent permitted by law, Tesla disclaims any and all liability arising out of any such use of your Powerwall.

Further, Tesla reserves the right to refuse to service any Powerwall used for these purposes

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<sup>64</sup> BYD Lithium Battery Co Ltd, *Warranty Letter for BYD Battery Box & Battery Plus (B-Box & B-Plus 2.5/ 5.0/ 7.5/ 10.0)* (14 December 2016) 360Energy, 6.11 [https://www.360energy.com.au/wp-content/uploads/2016/08/B-BOX\\_Product\\_Warranty\\_letter\\_20161214.pdf](https://www.360energy.com.au/wp-content/uploads/2016/08/B-BOX_Product_Warranty_letter_20161214.pdf)

<sup>65</sup> Tesla Motors Netherlands B.V., *Tesla Powerwall Warranty (Australia and New Zealand)* (9 February 2017), p. 4 [https://www.tesla.com/sites/default/files/pdfs/powerwall/Powerwall\\_2\\_AC\\_Warranty\\_AUS-NZ\\_1-0.pdf](https://www.tesla.com/sites/default/files/pdfs/powerwall/Powerwall_2_AC_Warranty_AUS-NZ_1-0.pdf)

and disclaims any and all liability arising out of Tesla's service or refusal to service your Powerwall in such circumstances."

**Table 4: Common exclusions in battery warranties by manufacturer/supplier cover damage or defects to the batteries arising from**

<b>Company</b>	<b>Misuse or abuse</b>	<b>Incorrect installation</b>	<b>Faulty wiring or incompatible devices</b>	<b>Unauthorised product modification</b>	<b>Maintenance by unauthorised personnel</b>	<b>Force majeure event</b>	<b>Failure to operate in accordance with installation/product manual</b>	<b>Electrical surges or network defects</b>	<b>Unsuitable physical environment</b>	<b>Any attempt to modify the lifespan of the battery without manufacturer's consent</b>	<b>Use of incompatible component/product</b>	<b>Visual imperfections or non-excessive noise, vibrations</b>	<b>Shipping or transportation</b>	<b>Negligence</b>	<b>Any other incidental or consequential damages</b>	<b>Animals</b>	<b>Removal from original location, reinstallation</b>	<b>Normal wear and tear</b>
BYD Lithium Battery Co, Ltd	✓	✓	✓	✓	✓	✓	✓					✓	✓					
Deep Cycle Systems Pty Ltd	✓	✓				✓	✓	✓	✓			✓		✓				✓
Enphase Energy, Inc	✓	✓		✓		✓	✓	✓	✓			✓	✓					✓
Fronius	✓	✓				✓	✓	✓	✓				✓					
GCL System Integration Technology Co., Ltd		✓		✓	✓	✓	✓		✓			✓					✓	
LG Chem, Ltd		✓	✓	✓	✓	✓	✓	✓			✓	✓						
Pylon Tech	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓				✓	
Redflow	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓						✓
Samsung SDI	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓					
SimpliPhi Power, Inc	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓					✓

Company	Misuse or abuse	Incorrect installation	Faulty wiring or incompatible devices	Unauthorised product modification	Maintenance by unauthorised personnel	Force majeure event	Failure to operate in accordance with installation/product manual	Electrical surges or network defects	Unsuitable physical environment	Any attempt to modify the lifespan of the battery without manufacturer's consent	Use of incompatible component/product	Visual imperfections or non-excessive noise, vibrations	Shipping or transportation	Negligence	Any other incidental or consequential damages	Animals	Removal from original location, reinstallation	Normal wear and tear
Sonnen Australia Pty Limited	✓		✓	✓	✓	✓	✓				✓		✓	✓				✓
Sunverge Energy Australia Pty Ltd	✓	✓		✓		✓	✓	✓	✓			✓				✓		✓
Tesla Motors Netherlands B.V.	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓				✓	✓
TrinaBEST (to be re-branded as Trina BESS)	✓	✓		✓	✓	✓	✓	✓	✓			✓	✓					✓

**Key questions for consumers considering warranty exclusions in battery warranties**

What are the events that will void your warranty?

Can the terms of the warranty be changed at any time at the sole discretion of the manufacturer, without the provision of notice to the user?

### 3.6 Remedies available under the warranty

#### 3.6.1 Repair or replace at the sole discretion of the manufacturer/supplier

There is a clear market standard that has emerged in terms of the remedies available in respect of a breach of both the workmanship/defects warranty and the capacity retention/performance warranty. The manufacturers/suppliers will generally elect at their sole discretion to either repair or replace the faulty product, possibly using refurbished products. Further, any replacement or repair of the product is expressly stated not to lead to the renewal or extension of the warranty period. Unlike the insurance theory of contractual warranties,<sup>66</sup> in the context of the residential battery storage systems, even the process of replacing or repairing a faulty or defective battery is likely to impose additional costs on the end consumer.

#### 3.6.2 The hidden additional costs associated with repair or replacement

Aside from the lost opportunity costs associated with not having a working energy storage system, some manufacturers such as Fronius, Samsung SDI, SimplPhi Power, TrinaBest have explicitly stated in their warranties that the costs associated with removing and shipping the defective battery, and installing or reinstalling the repaired or replacement battery are to be borne by the end consumer and not the manufacturer. All of the warranties studied were also silent on what happens to the defective battery if it is deemed to be at the end of its life through no fault of the consumer. Lead acid battery recycling is available in Australia but there is only a very limited domestic recycling program available for lithium ion batteries.<sup>67</sup> As a result, it would appear that the end-consumer would also be legally responsible for bearing the transportation and recycling costs associated with the safe collection and transport overseas of the depleted lithium ion batteries. This would mean that where a consumer receives a faulty or defective battery, they would be ultimately responsible for paying the transportation and recycling costs of two batteries at the end of their life. As the energy storage industry in Australia is still in relative infancy, it is currently difficult to predict what the added financial burden of this would be, however, as lithium ion is a “controlled substance” for the purposes for the Hazardous Waste Act it is not inconceivable that the costs could be significant.<sup>68</sup>

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<sup>66</sup> Above n 40.

<sup>67</sup> Helen Lewis Research, *Lithium battery consultation report* (3 August 2016) Commonwealth Department of the Environment, p. 16 <http://www.environment.gov.au/system/files/resources/1ac8df29-bb6c-4db6-8254-81fdbba03491a/files/li-ion-battery-consultation-report.pdf>

<sup>68</sup> Randell Environment Consulting, *Waste lithium-ion battery projections* (19 July 2016) Commonwealth Department of the Environment, p. 2 <http://www.environment.gov.au/system/files/resources/dd827a0f-f9fa-4024-b1e0-5b11c2c43748/files/waste-lithium-battery-projections.pdf>

### 3.6.3 Refunds

The standout warranty in terms of best practice for the remedies available is the warranty offered by Redflow, which states that they will at their discretion remedy the defect, supply a replacement product or repay the purchase price of the defective product. Redflow is the only manufacturer willing to refund the purchase price in its entirety. Some manufacturers such as Enphase, GCL Systems, LG Chem, will, at their sole discretion, consider providing a pro-rated credit or refund at the current value of the product, determined by applying depreciation formulas to the purchase price of the battery. This can have a significant impact on the amount of the refund that is available for a faulty product, with some manufacturers such as LG Chem and Pylon Tech refunding as little as 6-7% of the original purchase price if the product fails at the 7 year mark under their contractual warranty. This would be a clearly insufficient amount to enable the disaffected consumer to replace their battery. In such circumstances, consumers may be better seeking a remedy under the statutory consumer guarantees provided by the Australian Consumer Law, which are likely to provide higher levels of compensation than the contractual warranties.

#### **Key questions for consumers about the contractual warranties offered**

What remedies are available in the event of either (a) a faulty or defective warranty; or (b) unacceptable degradation of the battery capacity?

Are these remedies at the election of the consumer or at the sole discretion of the manufacturer/supplier?

Is the manufacturer or the consumer responsible for the costs associated with repairing or replacing the battery such as removal of the faulty battery, shipping costs, installation or reinstallation and recycling at end of life?

If there is a refund available is it a full refund of the purchase price or is it the depreciated current cost of the battery?

### **3.7 Warranty transfer permitted to subsequent purchasers**

The ability to transfer the rights under the warranty is important when the residential energy storage system is affixed to the property and thus is likely to be transferred to subsequent purchasers if the property is sold during the life of the battery. Of the 14 manufacturers/suppliers studied for this research, five were silent on the issue, three outright prohibited transfers of the warranty to subsequent purchasers and six permitted transfers to subsequent purchasers subject to a range of conditions. These conditions generally included that the battery remain installed at its original installation location and not be moved, that the manufacturer/supplier was notified of the change of ownership of the system and provided their prior written consent to the transfer of the warranty.

#### **Key questions for consumers on the ability to transfer the warranty rights**

Is the benefit of the warranty transferable to a subsequent purchaser for value?

Is the benefit of the warranty transferable to another person if the residential energy storage system is transferred as a gift within the warranty period?

Does the residential energy storage system have to be installed at the original installation location for the entirety of the warranty period or can it be reinstalled at another location and still benefit from the warranty?



### 3.8 Limitations imposed on the application of other common law or statutory rights and damages

All contractual warranties are provided in addition to other common law or statutory rights such as the Australian Consumer Law (ACL)<sup>69</sup> and state government laws such as the *Sale of Goods Act 1923 (NSW)* (both discussed in greater detail at 4 below). While common law rights such as the ability to bring a claim in negligence may be able to be excluded under contract, often these statutory rights cannot be contracted out of in order to protect consumers. Since 1 January 2012, it is a legal requirement if you provide a warranty against defects for consumers that your contractual warranty complies with the Australian Consumer Law and explicitly states that the contractual warranty is provided in addition to the consumer guarantees provided in the ACL and does not limit or exclude their application.<sup>70</sup> This means that regardless of what is stated in the warranty document, in the event of a “major failure”<sup>71</sup> the consumer is entitled to a replacement or refund, and compensation for any other reasonably foreseeable loss or damages.

The ACL also mandates that if a manufacturer is providing a written warranty against defects that the warranty must be drafted in plain English and provided when the consumer purchases their residential energy storage system.<sup>72</sup> The ACL further provides requirements that the warranty documents have information consistent with the marketing materials associated with the product, such as the technical data specification sheets, and that the mandatory text specified in the ACL is provided. This text specifies that:

“Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.”<sup>73</sup>

A failure to display this text in the warranty document or otherwise attached to the product may lead to a substantial fine of \$50,000 per offence for a body corporate and \$10,000 per offence for a non-body corporate.<sup>74</sup>

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<sup>69</sup> Australian Consumer Law, contained in Schedule 2 of the *Competition and Consumer Act 2010 (Cth)*.

<sup>70</sup> Australian Competition and Consumer Commission, *Warranties against defects*

<https://www.accc.gov.au/business/treating-customers-fairly/offering-warranties/warranties-against-defects>

<sup>71</sup> ss 260, 268 of the Australian Consumer Law, Schedule 2 of the *Competition and Consumer Act 2010 (Cth)*

<sup>72</sup> ACCC, *Warranties against defects* <https://www.accc.gov.au/business/treating-customers-fairly/offering-warranties/warranties-against-defects>

<sup>73</sup> ACCC, *Warranties against defects*, <https://www.accc.gov.au/business/treating-customers-fairly/offering-warranties/warranties-against-defects>

<sup>74</sup> s 169 of the Australian Consumer Law, Schedule 2 of the *Competition and Consumer Act 2010 (Cth)*

Despite this, many of the warranties in our study were in breach of the Australian Consumer Law and provided misleading and deceptive statements in their warranty documents purporting to exclude any other statutory rights or implied guarantees of merchantability, fitness for purpose and hidden defects. They also sought to limit any prospective damages claims to a maximum amount of the purchase price of the battery and excluded liability for any consequential losses, damage or injuries.

The following manufacturers/suppliers did not provide the mandatory text explaining to consumers about their rights under the ACL in their warranties:

- BYD Batteries;
- Deep Cycle Systems;
- GCL Systems;
- Pylon Tech;
- Redflow;
- Samsung SDI;
- SimpliPhi Power; and
- TrinaBest.

#### **Key questions for consumers on the limitations imposed on other legal rights**

Does the warranty contain limitations on my ability to bring a claim for negligence?

Does the warranty purport to limit my statutory rights under the Australian Consumer Law?

Does the warranty provide information that differs from the other written documents provided by the manufacturer/supplier such as the technical data sheet?

Does the warranty document or product packaging display the mandatory text from the ACL?

### 3.8 Governing law clause

The last important issue for consumers to consider when reviewing their contractual warranty document for their residential energy storage system is what the applicable governing law is under the contract. This is a relevant inquiry because the governing law may enable the contractual warranty to limit the application of the laws in the state where the battery is to be installed as they apply in respect to negligence claims, Sale of Goods or even simply increase costs if the consumer has to take the manufacturer to court to enforce their warranty rights.

Of the 14 manufacturers/suppliers whose warranty documents we studied, ten did not stipulate the governing law of the contract. This means that the law is likely to be determined by the law of the sales contract or the law of the state in which the system is being installed, though a number of other options are also available. This could add uncertainty, costs and create delays in the event of a dispute over the warranty. LG Chem stated that the “Warranty is subject to the law of Australian State.”<sup>75</sup> It is not clear what this means, whether the warranty is subject to Australian law generally or whether it is subject to the law applicable in the relevant state of purchase, again this creates uncertainty. Best practice is evident in the warranty contracts from Tesla, Redflow and Sunverge. Tesla states that their “warranty and any dispute or claim arising out of or in connection with it is governed and construed in accordance with the laws of the country or (if applicable) with the laws of the state or province in where your Powerwall was first installed.”<sup>76</sup> While, Redflow and Sunverge both clearly state that their warranties are subject to the laws of Queensland.

#### Key questions regarding the governing law clause

Does the governing law clause on the warranty apply the law of the Australian state in which the battery warranty system was first installed?

Is the governing law clause the law of a foreign jurisdiction?

<sup>75</sup> LG Chem Ltd, *LG Chem Lithium-ion Battery Limited Warranty: RESU3.3 / RESU6.5 / RESU10 Battery Storage System* (11 January 2017) SolarQuotes [http://www.solarquotes.com.au/blog/wp-content/uploads/2017/01/20170111-RESU3.3\\_6.5\\_10-LG-Chem-Lithium-ion-Battery-Limited-Warranty-AU.pdf](http://www.solarquotes.com.au/blog/wp-content/uploads/2017/01/20170111-RESU3.3_6.5_10-LG-Chem-Lithium-ion-Battery-Limited-Warranty-AU.pdf)

<sup>76</sup> Tesla Motors Netherlands B.V., *Tesla Powerwall Warranty (Australia and New Zealand)* (9 February 2017), p. 4 [https://www.tesla.com/sites/default/files/pdfs/powerwall/Powerwall\\_2\\_AC\\_Warranty\\_AUS-NZ\\_1-0.pdf](https://www.tesla.com/sites/default/files/pdfs/powerwall/Powerwall_2_AC_Warranty_AUS-NZ_1-0.pdf)

#### **4. What other remedies are available to the Australian consumer in the event of an issue with a residential battery storage system?**

##### **4.1 Statutory protections**

In addition to the express contractual warranties that may be offered by manufacturers, suppliers or retailers, consumers may benefit from additional protections in the form of statutory consumer guarantees or conditions being implied into their contracts. In New South Wales, there are two main pieces of legislation which protect consumers of residential battery storage systems: the Australian Consumer Law (ACL) which is found in Schedule 2 of the *Competition and Consumer Act 2010* (Cth) and the *Sale of Goods Act 1923* (NSW). Where a consumer can establish the presence of misleading or deceptive conduct, they may also be able to bring a claim for damages under s 18 of the ACL. Alternatively, where a consumer can prove that they have suffered loss or damage, commonly in the form of property damage, personal injury or pure economic loss, as a result of the negligence of a manufacturer of their residential energy storage system, they may also be able to bring a claim under the *Civil Liability Act 2001* (NSW). However, this latter cause of action is less likely to be available due to the widespread practice within the Australian energy storage market of excluding liability for such claims. Each of these potential claims shall be addressed in turn.

##### **4.2 Statutory consumer guarantees under the Australian Consumer Law (2010)**

Statutory consumer guarantees are valuable to consumers because the rights acquired under these sections of the ACL cannot legally be excluded by contract.<sup>77</sup> Under the ACL, consumer guarantees are available for “consumers”<sup>78</sup> who purchase, hire or lease “goods”<sup>79</sup> in the form of a residential energy storage system for either:

- (a) \$40,000 or less; or
- (b) where the residential energy storage system costs more than \$40,000 but is deemed to be of a kind that is ‘ordinarily acquired for their own personal, domestic or household use or consumption’.

These consumer guarantees also cover the installation of a residential energy storage system under the definition of “services” where the amount payable for the installation services is:

- (a) \$40,000 or less; or

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<sup>77</sup> Cavanagh K., Behrens S., Price C., Lim O., Haigh N., Fleming A., Oliver E., Mankad A., and Bhatt A. I., “Energy storage safety: Responsible installation, use and disposal of domestic and small commercial battery systems” (2015) *CSIRO report EP156209*, Australia, p. 29

<sup>78</sup> s 3 of the Australian Consumer Law, Schedule 2 of the *Competition and Consumer Act 2010* (Cth)

<sup>79</sup> *Ibid* s 2.

- (b) where the services cost more than \$40,000 but is deemed to be of a kind that is ‘ordinarily acquired for their own personal, domestic or household use or consumption’.<sup>80</sup>

#### **4.3 The application of consumer guarantees to residential battery storage systems**

There are a number of consumer guarantees that provide protections for consumers purchasing residential battery storage systems, the most relevant of which are:

**1. The residential energy storage system must be of acceptable quality (s 54 of the ACL):**

A residential energy storage system will be deemed to be of acceptable quality if it is fit for purpose, acceptable in appearance and finish, free from defects, safe and durable. In making an assessment as to whether a system meets these criteria for “acceptable quality,” the ACL requires that regard be given to the nature of the energy storage system, the price, any statements made on the packaging or label and any other representation made about the system by the supplier or manufacturer.

**2. The residential energy storage system must be fit for any disclosed purchase (s 55 of the ACL):**

Where the consumer either expressly discloses or implies that the residential energy storage system is being acquired for a particular purpose (the ‘disclosed purchase’) (regardless of whether or not that purpose is one for which the goods are commonly supplied), then the consumer can benefit from a guarantee that ‘the goods are reasonably fit for any disclosed purpose, and for any purpose for which the supplier represents that they are reasonably fit.’ This consumer guarantee applies regardless of whether the disclosed purpose was (a) made known, expressly or by implication to ‘(i) the supplier; or (ii) a person by whom any prior negotiations or arrangements in relation to the acquisition of the goods were conducted or made; or if (b) the consumer makes known to the manufacturer of the goods either directly or through the supplier or the person referred to above.’<sup>81</sup>

**3. That the residential energy storage system meets its product description (s 56 of the ACL).**

**4. That the residential energy storage system must have spare parts and repair facilities available for a reasonable time after purchase unless the customer is told otherwise prior to purchase (s 58 of the ACL).**

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<sup>80</sup> Ibid s 3(3).

<sup>81</sup> Ibid s 55(2).

**5. That the residential energy storage system must meet any express warranties provided by the manufacturer or supplier (s 59 of the ACL).**

This means that any additional promises made about the product quality, reliability or performance of the residential energy storage system are also covered by an implied consumer guarantee.

The application of the consumer guarantees to the installation of residential battery storage systems  
There are also consumer guarantees that are applicable to the installation of residential battery storage systems including that:

- the system be installed with due care and skill (s 60 of the ACL);
- that where a particular purpose has been disclosed that the installation service will be fit for the particular purpose (s 61 of the ACL); and
- that where date for the installation services are not fixed by contract or agreed between the supplier of the services and the consumer that the services must be supplied within a reasonable time (s 62 of the ACL).

#### **4.4 Breach of consumer guarantees**

Should any of these consumer guarantees be breached, the consumer may generally take action against either the manufacturer or the supplier of the goods or services. For the purposes of the ACL, the definition of “manufacturer” covers not only the firm who produced or assembled the residential energy storage system but also anyone who holds themselves out as the manufacturer, allows their brand to be applied to the system, or imports the goods into Australia if at the time of importation the actual manufacturer does not have a place of business in Australia.<sup>82</sup> The “supplier” is the person who supplied the goods or services to the consumer.<sup>83</sup> The ability to bring a claim against either the manufacturer or the supplier is important because most manufacturers of residential battery storage systems found in the Australian market are foreign firms located offshore and the importers may be difficult for consumers to identify. The ACL also provides an indemnity to the supplier where the manufacturer would otherwise be liable.<sup>84</sup> There are two exceptions to the rule that claims may be brought against a supplier. The first relates to the consumer guarantee on express warranties provided by a manufacturer<sup>85</sup> and the second relates to the guarantee stipulating

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<sup>82</sup> Ibid s 7(1).

<sup>83</sup> Ibid s 2.

<sup>84</sup> Ibid s 274.

<sup>85</sup> Ibid s 59.

that the manufacturer ensuring the availability of spare parts and repair facilities.<sup>86</sup> Both these claims may only be brought against the manufacturer.

#### **4.5 Remedies available from the suppliers of residential battery storage systems**

##### **4.5.1 Major failures**

The remedies available in relation to a breach of the consumer guarantees vary depending on whether the breach is deemed to be a “major failure” for the purposes of s 260 of the ACL or not. All of the following circumstances would constitute a “major failure” in the context of the consumer guarantees implied into contracts for the purchase of residential battery storage systems:

1. If the system would not have been acquired by a reasonable consumer had they known the nature and extent of the failure;<sup>87</sup> or
2. If the system significantly departs from its product description, for example by having a much lower usable battery capacity;<sup>88</sup> or
3. If the system is not fit for the purpose of storing excess electricity generated by a residential household and thus cannot be remedied easily and within a reasonable time to make it fit for purpose;<sup>89</sup> or
4. If the system is not fit for a disclosed purpose and cannot be remedied easily and within a reasonable time to make it fit for such a disclosed purpose;<sup>90</sup> or
5. If the system is not of acceptable quality because it is unsafe.<sup>91</sup>

Where the failure fits within the definition of a “major failure” or is a failure which cannot otherwise be remedied then, under s 259(3) of the ACL, the consumer may either reject the residential energy storage system and seek a replacement or seek a refund at the consumer’s sole election. There are two limitations on the right to rejection that may be relevant to a consumer who purchases a residential energy storage system. First, if the rejection period for the system has ended, taking into account what a reasonable period of time would be for the relevant failure to become apparent having regard to the type of goods, the use to which the consumer is likely to put the system, the length of time and amount of use that it is reasonable to expect the system to be used for.<sup>92</sup> The

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<sup>86</sup> Ibid s 58.

<sup>87</sup> Ibid s 260(a).

<sup>88</sup> Ibid s 260(b)(i).

<sup>89</sup> Ibid s 260(c).

<sup>90</sup> Ibid s 260(d).

<sup>91</sup> Ibid s 260(e).

<sup>92</sup> Ibid s 262(1)(a).

second, and arguably more relevant, limitation occurs where the residential energy storage system has been attached to, or incorporated in, any real property and they cannot be detached or isolated without damaging them.<sup>93</sup> This is likely to be an issue for residential battery storage systems, which are going to be either integrated into existing PV solar systems, or which will come as a single embedded system and attached to either the side of the house or the interior of the garage. Consumers may also not seek to reject the residential energy storage system and are then entitled to the difference between the purchase price paid and the diminution in value of the storage system containing the major failure.<sup>94</sup>

In addition to the rights of replacement or refund, consumers may also be able 'recover damages for any loss or damage suffered by the consumer because of the failure to comply with the guarantee if it was reasonably foreseeable that the consumer would suffer such loss or damage as a result of such a failure.'<sup>95</sup> This may include any other contracts associated with the residential energy storage system including the remote management of the system to determine when the system should store energy and when it should either allow the energy to be self-consumed or fed back into the grid.

#### **4.5.2 Minor failures**

Where the failure does not fit within the definition of a "major failure," the supplier may choose to remedy the failure by either repairing the faulty product, replacing the faulty product or providing the consumer with a refund.<sup>96</sup>

#### **4.6 Sale of Goods Act 1923 (NSW)**

Where the consumer purchases the residential energy storage system outright in exchange for money consideration, they may also acquire rights under the *Sale of Goods Act 1923* (NSW). This Act will imply three conditions (i.e. essential or fundamental terms) into the contract for the sale of goods that are relevant to purchasers of residential battery storage systems:

1. The system will correspond to their description;<sup>97</sup>
2. The system will be reasonably fit for purpose, providing that the purchaser can show that they disclosed the purpose for which the system was to be used, relied on the seller's judgement and skill and that the seller usually trades in that type of goods;<sup>98</sup> and

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<sup>93</sup> Ibid s 262(1)(d).

<sup>94</sup> Ibid s 272(1)(a).

<sup>95</sup> Ibid s 272(1)(b).

<sup>96</sup> Ibid s 259(2).

<sup>97</sup> s 18, *Sale of Goods Act 1923* (NSW)

<sup>98</sup> Ibid s 19(1).



3. The system was of merchantable quality.<sup>99</sup>

Where one of these implied conditions is breached, the consumer has two potential remedies, compensation for their losses or rescission of the contract (i.e. a court order that the contract be set aside and the parties are returned to the position they were in prior to the formation of the contract).

#### 4.7 Misleading and deceptive conduct

A further statutory protection for consumers is found in s 18(1) of the Australian Consumer Law which states that:

“A person must not, in trade or commerce, engage in conduct that is misleading or deceptive or is likely to mislead or deceive.”<sup>100</sup>

In the context of residential battery storage systems, misleading and deceptive conduct may occur if the manufacturer or seller of the product provides misleading product comparisons, makes express statements that are untrue or makes unsubstantiated claims about product performance. The test to be applied is an objective test and it is not relevant that the manufacturer or seller did not intend to mislead or deceive. If there is found to be a breach of this section, then the consumer may be able to bring a damages claim and the party responsible for the misleading or deceptive claim has committed an offence punishable by a penalty of up to \$1.1m for a body corporate or \$220,000 for any other party.<sup>101</sup>

#### 4.8 Negligence claims

To the extent that such claims are not excluded or limited by the warranty document, if there has been a product failure, which has caused the consumer to suffer damage, then consumers may also be able to bring a claim for negligence under the *Civil Liability Act 2002* (NSW). In order to bring a successful claim, the consumer will need to prove that:<sup>102</sup>

- the established category of duty of care owed by manufacturers to end consumers<sup>103</sup> applies to them;
- that that duty of care was breached due to a failure on the part of the manufacturer to apply an appropriate standard of care with regard to safety or product design or quality;<sup>104</sup>

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<sup>99</sup> Ibid, s 19(2).

<sup>100</sup> s 18(1) Australian Consumer Law, Schedule 2 of the *Competition and Consumer Act 2010* (Cth)

<sup>101</sup> Ibid s 224(3).

<sup>102</sup> s 5E, *Civil Liability Act 2002* (NSW)

<sup>103</sup> *Donoghue v Stevenson* [1932] AC 562

<sup>104</sup> s 5B, *Civil Liability Act 2002* (NSW)

- that the manufacturer's breach caused the end consumer to suffer loss or damage (commonly in the form of either property damage, personal injury or pure economic loss) and that this loss or damage was not too remote;<sup>105</sup> and
- that there were no defences available to reduce or completely remove liability for the claim.

If the consumer is successful in their claim, they may be eligible to receive compensation for their loss or damage suffered. However, any compensation claim will be subject to the caps on damages contained with the *Civil Liability Act 2001* (NSW).

A further hindrance to Australian consumers bringing a negligence claim against a manufacturer is that practically speaking such claims are dependent upon the manufacturer having some assets in Australia. This is because if the Australian consumer is successful in their claim, there need to be assets within Australia to provide security for the damages ordered. Without any assets within Australia, such a damages order would be dependent upon the individual consumer enforcing the damages order via the courts of a foreign jurisdiction, which would not be cost effective (and in some cases, even possible) thereby rendering the order unenforceable.

Given many batteries and their components are currently being manufactured in China, it is also worth considering the Chinese law to assess whether it would be possible to aggregate the claims of a sufficient number of Australian plaintiffs to make a class action conducted in China against a Chinese manufacturer viable. While it is foreseeable that if a sufficiently large class of plaintiffs were aggregated that such a claim could be economically viable, it appears highly unlikely that the Chinese courts would be willing to find that a "joint litigation action" under Articles 53 – 56 of the *Civil Procedure Law of the People's Republic of China 1991*, as amended 2012,<sup>106</sup> would apply to solely foreign plaintiffs.

As a result, where the manufacturer is a foreign firm with no or very limited Australian assets, the consumer will often have to pursue either the importer, who may be hard to identify, or more commonly, the supplier of the residential energy storage system under either a contractual warranty claim or for a breach of the Australian Consumer Law or the *Sale of Goods Act*. However, relying on the ability to get legal recourse from a solar/battery supplier is not without considerable risk for the consumer. Since 2011, over 500 solar companies in Australia listed on the Australian Securities

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<sup>105</sup> s 5D(1) *Civil Liability Act 2002* (NSW)

<sup>106</sup> *Civil Procedure Law of the People's Republic of China* (People's Republic of China) National People's Congress, Order No. 44, 9 April 1991, as amended for the second time in accordance with the *Decision on Amending the Civil Procedure Law of the People's Republic of China* as adopted at the 28th Session of the Standing Committee of the Eleventh National People's Congress on 31 August 2012.

Investments Commission website have been closed, put into liquidation, had administrators appointed or been proposed for de-registration.<sup>107</sup> This includes the largest companies that had previously operated in the Australian market. There have been similar experiences in the energy storage markets overseas, with two of the largest original participants in the US market, A123 and Xtreme Power, both going into bankruptcy.<sup>108</sup> As a result, it is important for consumers to understand that both their contractual warranties and their ability to pursue statutory protections are reliant on the manufacturers, importers and suppliers of the residential energy storage system, being sufficiently creditworthy to be able to fulfil a valid claim against them.

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<sup>107</sup> LG Solar Energy, *List of companies on ASIC website* (26 August 2016)

[https://www.lgenergy.com.au/uploads/download\\_files/493304aacda2096b881db7ea21c06a21c03936f1.pdf](https://www.lgenergy.com.au/uploads/download_files/493304aacda2096b881db7ea21c06a21c03936f1.pdf)

<sup>108</sup> Share Tibken, *Government-funded battery maker A123 files for bankruptcy* (17 October 2012) CNET

<https://www.cnet.com/au/news/government-funded-battery-maker-a123-files-for-bankruptcy/>; Jeff St. John, *Xtreme Power, Grid-Scale Energy Storage Startup, Files for Bankruptcy* (23 January 2014) Green Tech Media  
<https://www.greentechmedia.com/articles/read/xtreme-power-grid-scale-energy-storage-startup-files-for-bankruptcy>

## 5. Conclusions

In conclusion, this report has found that there is a high likelihood that similar to other areas of battery litigation, residential battery storage systems are likely to be subject to consumer claims arising out of total battery failure, poor battery performance, poor battery life, misleading and deceptive conduct, negligence or other torts based claims and safety defects. Contractual warranty theories suggests that the warranty should act as a risk allocation tool that provides both insurance to prospective purchasers and an incentive to manufacturers/suppliers to improve the quality of their products. However, the study of the warranties of 14 different manufacturers/suppliers active in the Australian residential battery storage market found that these roles are often not fulfilled with many of the contractual warranties allocating all of the shared risks to the end consumer. This left the consumer in a position where they were unable to best manage or mitigate the risk and secondary insurance products are not currently available to allow them to hedge the risk.

Of particular concern was the identification of misleading and deceptive conduct on the part of some manufacturers/suppliers who had differing information contained in their technical data specification sheets and their warranty documents. A further serious concern relates to the fact that while almost all manufacturers claimed to exclude consumers statutory and common law rights within their warranty document, eight manufacturers/suppliers also did not include the mandatory text found in the ACL, which acknowledges the rights of consumers that cannot be contracted out of, including in respect of the consumer guarantees. The consumer guarantees found in the ACL and implied into the purchase contracts play an important role in the context of consumer protection within the residential battery storage sector. Where there is a “major failure” the consumer guarantees will often provide the consumer with greater choice about how they want their defective residential battery storage system remedied and they also allow for compensation for reasonably foreseeable consequential losses. This will generally leave the consumer in a far better position than their rights under the contractual warranty, which may limit their available remedies to a repair or replacement using refurbished parts or a pro-rated warranty, which is insufficient to fund a replacement battery storage system. However, even the consumer guarantees are not without their challenges, with their operation reliant on the manufacturer having assets in Australia to pursue or, the supplier being sufficiently creditworthy to be able to pursue a claim against.

This research has highlighted some serious flaws with the way in which consumers purchasing residential battery storage systems are protected. There is an urgent need for either Australian

Standards or International Standards to be widely adopted by the manufacturers and suppliers within the sector so as to provide consumers with greater certainty as to what they should reasonably expect from their battery storage system. Further, given the complexities of the contractual warranties within the sector, greater education is required both of the manufacturers and suppliers about their legal responsibilities under Australian law but also for consumers about their consumer rights and the different means by which they can protect those rights.

## **Recommendations**

That PIAC send a copy of this report to the Australian Competition and Consumer Commission, the Clean Energy Council, the Australian Energy Storage Alliance and the Energy Storage Council to put them on notice about the widespread breaches of the ACL in respect of documenting the warranty from defects and the failure to use the mandatory language which acknowledges that consumers retain statutory rights under the ACL which by law cannot be excluded.

That PIAC host a seminar run by Dr Crossley for manufacturers/suppliers of energy storage systems to notify them of their legal obligations with respect to the provision of contractual warranties for residential battery storage systems and their obligations with respect to consumer guarantees under the Australian Consumer Law.

That PIAC publish the list of questions for consumers to assess different contractual warranties for residential battery storage systems against.

Appendix 1: Analysis of the contractual warranties offered by the manufacturers of residential battery storage systems sold within the Australian market

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
BYD Lithium Battery Co, Ltd  Australian representative: Alps Power Pty Ltd	Battery Box and Battery Plus (B-Box 2.5/ 5.0/ 7.5/ 10.0)	14 December 2016 <sup>109</sup>	Lithium iron phosphate	B-Box 2.5: 2.56kWh/ 2.45kWh  B-Box 5: 5.12kWh/ 4.9kWh  B-Box 7.5: 7.68kWh/ 7.35kWh  B-Box 10: 10.24kWh/ 9.8kWh	6,000 cycles @ 96% DoD	Operating temperature: 0°C -+50°C  Storage temperature: -10°C - + 40°C  Humidity range: not stated	10 years from the date of invoice	Warranty Products capacity warranty: Please refer to the below warranty chart for the first ten (10) years use and at least sixty percent (60%) of battery's usable capacity (net capacity) after the tenth (10th) year of the date of invoice from vendor or within the throughput energy as shown in below chart"  "3.1 If the battery is within capacity warranty period and the battery capacity is lower than warranted capacity which verified by personnel recognized or authorized by BYD, BYD agrees to provide replace or repair service subject to this Warranty Letter."	"4. Preconditions for warranty Following preconditions shall be met: 4.1 Product shall fall within the warranty period. 4.2 Any system failure, fault or warning information must be reported to BYD or authorized service partner within 2 weeks of appearance. 4.3 Product shall be installed by personnel recognized or authorized service partner. 4.4 Customer shall correctly operate and use the system according to user manual and installation manual. 4.5 Customers shall provide the proof of the original purchase of the product. 4.6 Provided that in any event the installation of the Subject of the Warranty for the Customer shall be completed within twelve (12) months from the date of manufacturing date of the Subject of the Warranty. 4.7 The ambient temperature during the operation of the product must not exceed 0 °C~50 °C temperature range and the product shall not be exposed to or to be stored in a temperature higher than 55 °C.The battery room must be ventilated in accordance with the requirements of the battery manufacturer. 4.8 The product can only be installed and operated in household energy storage applications with an average of one full cycle1 per day. The B-BOX is not suitable for supplying life-sustaining medical devices and automotive application. The warranty will be voided if usage exceeds household energy storage applications. 4.9 Product must be operated with a battery inverter approved by BYD as stated in the compatibility list of BYD from time to time."	"6 Exception of Warranty: 6.1 Quality or capacity warranty period expires. 6.2 Damage and defect caused to products by customer due to improper use, misuse, abuse, which nonconforming with user manual or accident. 6.3 Damage caused during transport, incorrect product installation, exceed of temperature range and improper use. 6.4 Unauthorised wiring and use with faulty or incompatible devices or devices with safety issues. 6.5 Product arbitrarily modified or its function changed without authorization from BYD. 6.6 Any changes to the installation do not in accordance with the B-BOX installation manual. 6.7 Damage caused to product due to maintenance and other services conducted not by personnel authorized by BYD. 6.8 Customer fails to provide correct product serial number or product serial number is	"5 Replace or Repair 5.1 In the event that any Product covered by the warranty as this Warranty Letter and confirmed by BYD to be defective or non-conformity, BYD shall replace or repair the defective or non-conforming Product at its own discretion. Any maintenance or replacement shall not be deemed as extension or recalculation of the warranty period. 5.2 BYD or Service Provider should respond within 2 working days after receipt after service. 5.3 BYD will be responsible for the approved repair or replacement costs in connection with such non-conforming or defective Product. BYD reserves the ownership of replaced battery or Products. Unless otherwise agreed by BYD, the replaced battery or Products shall be returned by customer to the place designated by BYD in the same or similar package within 4 weeks. 5.4 Provided that BYD has discontinued the manufacture of the Product in issue at the time the related warranty claim which confirmed by BYD, BYD shall, at its sole option, replace it with a different type of Product (of 1 Full cycle:Discharge the usable capacity of a fully charged battery and fully charge it afterwards. Micro cycles sum up to full cycles according to amount of energy charged and discharged. mutually agreed size, color, shape and/or power) or refund the purchase price prorated by the days of the relevant Warranty Period remaining. 5.5 Replacement of battery, components or Products may not be brand new but with quality and specification compliant with	Warranty is silent on this issue so it would appear that a warranty transfer may be permissible if the other warranty conditions are met.	"8 Warranty restriction Unless otherwise specified herein, to the extent permitted by applicable law, the Warranty Letter and above remedies shall be exclusive and replace all other guarantees and remedies, oral or in writing, expressed or implied. To the extent permitted by applicable law, BYD expressly reject any and all legal or implied warranty, including but not limited to warranties of merchantability, fitness for a particular purpose and hidden or potential defects. If BYD cannot abandon implied warranty as prescribed by applicable law or the guarantee specified by applicable laws, all of such guarantees and warranties shall limit to implied warranty as prescribed by applicable law or the scope within	Not stated	No – but acknowledges that such rights may exist under the applicable law and limits them to the fullest extent possible.	Safety Guidelines for Li-ion household battery system, Version 1.0E (Sicherheitsleitfaden Li-Ionen-Hausspeicher) IEC62619/ UN38.3/ UL1642

<sup>109</sup> BYD Lithium Battery Co Ltd, Warranty Letter for BYD Battery Box & Battery Plus (B-Box & B-Plus 2.5/ 5.0/ 7.5/ 10.0) (14 December 2016) 360Energy, <https://www.360energy.com.au/wp-content/uploads/2016/08/B-BOX Product Warranty letter 20161214.pdf>

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp./ambient temp./humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
										<p>undecipherable or modified without permission. 6.9 Product damage caused by external force, force majeure (unforeseeable, unavoidable and insurmountable objective events, including but not limited to war, civil war, strike, riot or other activities intervened by government) or other third party. 6.10 The defect cannot be overcome under the technology condition when the Products sold to customer. 6.11 Defects of Products arising due to technology update, or renewal of the national or regional laws or regulations. 6.12 Product damage caused by customer deliberately or by willful acts; 6.13 Failure report not provided within 2 weeks of appearance.”</p> <p>“7 Non-Applicability of warranty claim In case a warranty claim is reported which shows not to be valid, the costs incurred by BYD or installer due to this non-applicability of warranty claim shall be covered by customer unless this non-applicability was not visible for customer</p>	the Product specifications.”		<p>applicable laws and shall be under mandatory application according to applicable law. No distributor, agent or staff of BYD is authorized to make any revision, extension or addition to the quality warranty. The legality and enforceability of remaining clauses herein shall not be affected or damaged if any of clauses herein is adjudged to be illegal or unenforceable. Unless otherwise specified herein, to the maximum range permitted by applicable law, BYD shall not be liable for any direct, indirect, special, accidental or derivative losses caused by the purchase or use of products and its system, including but not limited to the loss of use, loss in income, actual or expected loss in revenue (including contract revenue losses), loss of the use of money, loss of anticipated savings, loss of business, loss of opportunity, loss of goodwill, loss</p>			



Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
										according to given circumstances."			of reputation, personal injury or damage loss, or the indirect or derivative loss or damage (including any expense arising from the replacement of equipment and property, resumption of production, etc.) caused by any reasons.  BYD'S liability from any cause whatsoever shall in no event exceed the amount of the purchase price paid by customer to byd for such product giving rise to the liability."			
Deep Cycle Systems Pty Ltd	DCS PV Series energy storage units  DCS PV 5  DCS PV 10	November 2016 <sup>110</sup>	Lithium iron phosphate	DCS PV 5: 5.12kWh/5.12kWh  DCS PV 10: 10kWh/10kWh	5,000 cycles @ 100% DOD	The ambient temperature during operation of the battery must not fall below -5°C or above 65 °C. The battery should not be exposed to an ambient temperature below -20°C or above 65°C.  Humidity range not stated.	10 years from the date of invoice	"DCS warrants and represents that the [battery] retains at least 80% of the Nominal Energy for 10 years after the date of invoice under proper conditions of use according to the installation manual during the term of the warranty."  "Nominal Energy herein means the initially rated capacity of the [battery] as printed on the product labels."	Must operate in accordance with the proper conditions contained in the installation manual.  "The precondition of the valid Performance Warranty shall be as follows; 1. The ambient temperatures during the operation of the Subject of Warranty must not fall below -5 degrees C or exceed 45 degrees C. 2. The Subject of the Warranty should not be exposed to an ambient temperature below -20 degrees C or above 65 degrees C. 3. Maximum warranted kW hours during the Warranty period is the Nominal Energy of the Subject multiplied by 3650 (total amount of days during a 10 year period); For example a DCS PV 5.0 which has a nominal energy rating of 5.12kWh multiplied by 3650 = 18,688 kWh. Should the	"DCS's warranty shall not cover defects or non-conformities in the Subject of the Warranty which are caused by normal wear and tear, inadequate maintenance, transportation, storage or faulty repair, misuse, neglect, accident or abuse, modification to the Subject of the Warranty by a third party other than DCS or DCS's agent approved by DCS, failure to observe the maintenance or operating instructions provided by DCS, or improper installation. The warranty shall not apply to	"DCS's liability under this Warranty shall be limited to the repair or replacement with new or refurbished product at DCS's option as herein provided of any defective Subject of the Warranty which have been reported by Customer's place of purchase under Assertion of Warranty Claims as defective, and upon verification by DCS, have been determined to be defective. "  "Replacement and repaired Subject of the Warranty shall be warranted for the remainder of the original warranty period. In any event, the replacement or repair shall not justify the renewal or new beginning of the warranty period."	No	No	Not stated	No	Not stated

<sup>110</sup> Deep Cycle Systems Pty Ltd, Performance Warranty for the DCS PV Series energy storage units (November 2016) SolarQuotes, [http://www.solarquotes.com.au/blog/wp-content/uploads/2017/03/DCS-PV-Series\\_Warranty-1.pdf](http://www.solarquotes.com.au/blog/wp-content/uploads/2017/03/DCS-PV-Series_Warranty-1.pdf)

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp./ambient temp./humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
									<p>subject be cycled greater than 3650 and less than 3850 than DCS warrants the subjects nominal energy to be above or equal to 60%. 4. Provided that in any event the installation of the Subject of the Warranty for the Customer shall be completed within 12 months from the date of manufacturer.</p> <p>"</p>	<p>defects caused by external influences including unusual physical or electrical stress (power failure surges, lightning, flood, fire, accidental breakage), which are not the responsibility of DCS. No warranty shall apply to any damages caused by goods to which the Subject of the Warranty is incorporated or installed into, or used together with, including any parts thereof.</p> <p>Except as herein expressly stated, there are no warranties or conditions, express or implied, by operation of law or otherwise, for any subject of the warranty thereof furnished hereunder. The parties agree that the implied warranties of merchantability and fitness for a particular purpose and all other warranties and/or guarantees, express or implied, are excluded from this transaction and shall not apply for the subject of the warranty. In no event shall DCS be liable for any special, incidental or consequential damages of any nature whatsoever for</p>						

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
										any reason (including, without limitation, lost profits, loss of use, loss of equipment or loss of revenues) regardless of the legal theory on which any such claim may be made, even if advised of the possibility of such damages. “						
Enphase Energy, Inc	Enphase Energy AC Batteries	1 August 2016 <sup>111</sup>	Lithium Iron Phosphate	1.2kWh/1.14kWh (per singular modular battery but the system is designed to be scaleable)	7300 cycles at 95% DoD	The workmanship warranty and/or the capacity retention warranty may be voided prior to the end of the warranty period if: (e) an AC battery is kept in an area where the average annual internal temperature is over 37°C In any one (1) year period; (f) an AC battery is kept at an ambient temperature of: (i) 55°C for 24 or more continuous hours; (ii) 60°C for more than one (1) continuous hour; or (iii) 70°C at any time;	1. Warranty Period. The “Warranty Period” (a) begins on the earlier of (i) 6 months from the AC Battery’s date of manufacture or (ii) the installation of the AC Battery at the Original Location (either, the “Warranty Start Date”); and (b) ends 10 years or 7,300 fully discharged cycles (whichever occurs first) from the Warranty Start Date. If Enphase repairs or replaces an AC Battery, the Workmanship Warranty and the Capacity Retention Warranty will continue on the repaired or replacement AC Battery	2. The Workmanship Warranty. During the Warranty Period, the AC Battery will, under use and conditions as set forth in the Installation Guide and the Enphase User Manual, conform to the AC Battery specifications set forth on the Data Sheet located at <a href="https://enphase.com/en-au/support/enphase-acbattery">https://enphase.com/en-au/support/enphase-acbattery</a> and be free from defects in workmanship and materials. 3. Capacity Retention Warranty. The AC Battery will maintain the ability to store and discharge energy during the Warranty Period at the minimum percentages set forth in the table below (the “Capacity Retention Warranty”), depending on the average annual internal temperature in the location in which the AC Battery is installed. Enphase will determine the average annual internal temperature as measured by the temperature sensors inside the AC Battery. The rated capacity of the AC Battery is based on a 1.2 kWh charge capacity, as	The workmanship warranty and/or the capacity retention warranty may be voided prior to the end of the warranty period if: (a) an AC battery is not registered with Enphase and connected to the internet within 45 days following the Warranty Start Date; (b) an AC battery loses its internet connection for More than 45 days at any time during the warranty period; (c) an AC battery is not installed pursuant to the terms of the Quick Install Guide / Installation Manual; (d) the end user or the transferee fail to follow any of the operating Guidelines set forth in the Enphase User Manual; (e) an AC battery is kept in an area where the average annual internal temperature is over 37 degrees celsius In any one (1) year period; (f) an ac battery is kept at an ambient temperature of: (i) 55 degrees celsius for 24 or more continuous hours; (ii) 60 degrees celsius for More than one (1) continuous hour; or (iii) 70 degrees celsius at any time; or (g) The workmanship warranty may be voided if the end user fails to report a defect within 90 days.	6. Exclusions. The Workmanship Warranty and the Capacity Retention Warranty do not apply to, and Enphase will not be responsible for, any defect in or damage to any AC Batteries: (a) that have been misused, neglected, tampered with, altered, or otherwise damaged, either internally or externally; (b) that have been improperly transported, handled, installed, operated, used or repaired, including use under conditions for which the AC Battery was not designed, use in an unsuitable environment, or use in a manner contrary to the Installation Guide and the Enphase User Manual or applicable laws or regulations; (c) that have been subjected to fire, water, generalized	4. Remedies. a. During the Warranty Period, if Enphase establishes the existence of a defect that is covered by the Workmanship Warranty, Enphase will, at its option, either (a) repair or replace the AC Battery free of charge, or (b) issue a prorated credit or refund for the AC Battery to the End User or Transferee in an amount equal to the current market value at the time the End User or Transferee notifies Enphase of the defect, as determined by Enphase. If Enphase elects to repair or replace the AC Battery, Enphase will, at its option, use new or reconditioned parts or products of original or improved design. b. During the Warranty Period, if Enphase establishes the existence of a defect that is covered by the Capacity Retention Warranty, Enphase will, at its option, either (a) provide a prorated credit for the lost capacity over the warranted term towards the purchase of a new AC Battery; or (b) repair or replace the AC Battery free of charge. If Enphase elects to repair or replace the AC Battery, Enphase will, at its option, use new or reconditioned parts or products of original or improved design. 5. RMA Process. To obtain replacement service, credit or refund (as applicable) under the Workmanship Warranty or the Capacity	Yes – “Warranty claims may only be made by the end user (pursuant to the terms of Section 5 – RMA Process) who acquired and put the AC Battery into use for the first time (the “End User”) or to a different end user (the “Transferee”) as long as the AC Battery remains at the original End User location (the “Original Location”) and the Transferee submits to Enphase a “Change of Ownership Form,” and pays the applicable fee (the “Transfer Fee”) within 30 days from the date of transfer to the Transferee. This submission is a requirement for continued Warranty coverage. The Transfer Fee is set forth in the Change of Ownership Form, and is subject to reasonable adjustment from time to time (as determined at Enphase’s discretion). The Change of Ownership Form and payment instructions are available at <a href="http://www.enphase.com/warranty">http://www.enphase.com/warranty</a> . “	Yes - 9. Limitation of Liability. To the extent permitted by law Enphase will not be liable For any special, direct, indirect, incidental or consequential damages, losses, Costs or expenses however arising, whether in contract or tort, including Without limitation any economic losses of any kind, any loss or damage to Property, or any personal injury. To the fullest extent permitted by law, Enphase’s liability arising out of or related to a claim under this warranty with Respect to an individual ac battery will not exceed 100% of the	Not stated	Yes	AS/NZS 4777.2:2005, AS/NZS 4777.2:2015 AS/NZS CISPR 22, AS/NZS 62040.1.1, UN 38.3

<sup>111</sup> Enphase Energy Inc, AC Battery Limited Warranty – Australia and New Zealand (1 August 2016) <https://enphase.com/sites/default/files/AC-Battery-Limited-Warranty-AU-NZ.pdf>

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp./ambient temp./humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
							<p>for the remainder of the original Warranty Period, as long as the replacement AC Battery is installed and energized within 90 days from date of receipt of Enphase's return shipment of the repaired or replacement AC Battery.</p>	<p>measured during a continuous charge from zero to full capacity at a current less than 10 amps and at a temperature of 20°C (+/- 10°C).</p> <p>If the average annual internal AC Battery temperature is below 28 degrees Celsius: WARRANTY PERIOD: AC BATTERY CAPACITY:</p> <p>Year 1 of the Warranty Period or 0.74 MWh of aggregate AC energy discharge throughput, whichever occurs first Cumulative average energy storage capacity at least 90% of AC Battery nameplate rating</p> <p>Years 2-5 of the Warranty Period or 3.53 MWh of aggregate AC energy discharge throughput, whichever occurs first Cumulative average energy storage capacity at least 85% of AC Battery nameplate rating</p> <p>Years 6-10 of the Warranty Period or 6.65 MWh of aggregate AC energy discharge throughput, whichever occurs first Cumulative average energy storage capacity at least 80% of AC Battery nameplate rating</p> <p>If the average annual internal AC Battery temperature is between 28 degrees Celsius and 37 degrees Celsius: WARRANTY PERIOD: AC BATTERY CAPACITY:</p> <p>Year 1 of the Warranty Period or 0.72 MWh of aggregate AC energy discharge throughput, whichever occurs first Cumulative average</p>		<p>corrosion, biological infestations, acts of nature, or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the AC Battery specifications, including high input voltage from generators or lightning strikes; (d) that have been subjected to incidental or consequential damage caused by defects of other components of the attached solar system; or (e) if the original identification markings (including trademark or serial number) of such products have been defaced, altered, or removed. 7. Items Not Covered. The Workmanship Warranty and the Capacity Retention Warranty does not cover (a) normal wear and tear or deterioration, or cosmetic, technical or design defects, or shortcomings which do not materially influence or affect energy storage or degrade form, fit, or function of the AC Battery; (b) noise or vibrations that is not excessive or uncharacteristic and does not impact the AC</p>	<p>Retention Warranty, the End User or Transferee must: (a) notify the Authorized Reseller from whom the AC Battery was purchased; (b) provide proof of the original purchase; (c) provide a description of the alleged defect; (c) provide the relevant serial number and the Warranty Start Date. End Users or Transferees that are unable to locate the Authorized Reseller from whom the AC Battery was purchased, should contact Enphase: For in country support in Australia or New Zealand please contact Enphase Customer Support at <a href="http://enphase.com/global/au/">http://enphase.com/global/au/</a> or by telephone at 1 800 006 374 (Australia) or +64 09 887 0421 (New Zealand).</p>		<p>purchase price Paid to Enphase for such AC battery. Some states and countries do not allow, or Restrict, the exclusion or limitation of damages, so the above limitation or Exclusion may not apply, or may only apply to a limited extent.</p>			

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp./ambient temp./humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
								<p>energy storage capacity at least 88% of AC Battery nameplate rating</p> <p>Years 2-5 of the Warranty Period or 3.32 MWh of aggregate AC energy discharge throughput, whichever occurs first Cumulative average energy storage capacity at least 80% of AC Battery nameplate rating</p> <p>Years 6-10 of the Warranty Period or 5.82 MWh of aggregate AC energy discharge throughput, whichever occurs first Cumulative average energy storage capacity at least 70% of AC Battery nameplate rating</p>		<p>Battery's performance; (c) damage that occurs during shipping or transportation after the AC Battery is sold to an Authorized Reseller; (d) damage or deterioration that occurs after the expiration or voiding of the applicable Warranty Period or that is reported more than 10 days after the expiration or voiding of such period; or (e) theft or vandalism of the AC Battery or any of its components. The Workmanship Warranty and the Capacity Retention Warranty does not cover costs related to the removal, installation or troubleshooting of the End User or the Transferee's electrical systems. The Workmanship Warranty and the Capacity Retention Warranty does not extend beyond the original cost of the AC Battery.</p>						
Fronius	<p>Fronius Solar Battery 4.5</p> <p>Fronius Solar Battery 6.0</p>	1 January 2017 <sup>112</sup>	Lithium iron phosphate	<p>4.5kWh/3.6kWh</p> <p>6kWh/4.8kWh</p> <p>7.5 kWh/6kWh</p> <p>9kWh/7.2kWh</p> <p>10.5kWh/8.4kWh</p>	8,000 cycles at 80% DoD	<p>Permissible ambient temperature range 5 - 35°C</p> <p>Permissible storage temperature range</p>	Fronius grants the purchaser (end consumer) of the Sony "IJ1001M" battery module (hereinafter	With the capacity guarantee, the manufacturer guarantees that a minimum capacity of 68% of the rated capacity of the Sony battery module will be retained for up to	A claim under the warranty exists in the event that the maximum recoverable capacity of the Product falls below 68% of the rated capacity on the data sheet within 15 years after purchase, or below 80% of the rated capacity on the data sheet	The purchaser of the Product cannot claim under this warranty if - the Products have not been installed inside (inside a building) and an	In the event of a warranty claim, the value of the affected Products will be replaced in compliance with the conditions listed below. The current value of the Products affected by this warranty is generally replaced through the delivery of one or more	Not stated	Not stated	Not stated	Yes - The benefits to the consumer given by this manufacturer's warranty are in addition to other rights	Yes - EC/EN 62133; EN 61000-6-2:2005, EN 61000-6-3:2007 + A1:2011, EN 62311:2008, FCC Part 15 Subpart B:2012 ClassB, UN 38.3

<sup>112</sup> Fronius, *Fronius Energy Package: Operating Instructions* (1 January 2017) [http://www.fronius.com/cps/rde/xbr/SID-C2549D97-FAC95D7B/fronius\\_australia/4204260222EN\\_008\\_02022017\\_547668\\_snapshot.pdf](http://www.fronius.com/cps/rde/xbr/SID-C2549D97-FAC95D7B/fronius_australia/4204260222EN_008_02022017_547668_snapshot.pdf)

Fronius, *Warranty Conditions for Fronius Inverters and the Fronius Datamanager* (1 January 2017) [http://www.fronius.com/cps/rde/xbr/SID-706ACDA5-4E4F1C25/fronius\\_international/SE\\_TOW\\_EN\\_AU\\_55\\_0117\\_411519\\_snapshot.pdf](http://www.fronius.com/cps/rde/xbr/SID-706ACDA5-4E4F1C25/fronius_international/SE_TOW_EN_AU_55_0117_411519_snapshot.pdf)

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
	Fronius Solar Battery 7.5 Fronius Solar Battery 9.0 Fronius Solar.Battery 10.5 Fronius Solar Battery 12.0			12kWh/9.6kWh		-40 °C - 65 °C  Permitted humidity 0 - 95 % (non-condensing)	referred to as the Products) for use as the battery system for a photovoltaic storage system a two-year Fronius Warranty Plus covering the entire Fronius Solar Battery from the date of dispatch from the Fronius factory. This warranty can be extended by registering online at <a href="http://www.solarweb.com">www.solarweb.com</a> plus ensuring that an internet connection is established at least once a month between <a href="http://FroniusSolar.web">FroniusSolar.web</a> and the Fronius Solar Battery. In this case the warranty holder receives a five-year Fronius Warranty Plus covering the Fronius Solar Battery plus a fifteen-year capacity guarantee covering the Sony "IJ1001M" battery module used, which	fifteen (15) years, despite ageing of the battery cells.	within 10 years after purchase. The purchaser may claim on the warranty only by contacting a Fronius installer. The Fronius Repair Center will assess the maximum recoverable capacity, and in case of a capacity below 80% of the rated capacity, the Repair Center will repair or replace the Product. The battery components supplied as replacements will provide a recoverable capacity of over 80% of the rated capacity or over 68% of the rated capacity respectively. Replaced battery components shall become the property of the manufacturer. Costs incurred for the assessment of the warranty claim (service use, capacity testing) are covered by this warranty only in the event of a confirmed warranty claim. Costs incurred for the implementation of the warranty claim (removal and installation costs, transport costs, etc.) are not covered by this warranty.	ambient temperature of 5 to 35 °C has not been maintained; - the Products are exposed to direct sunlight, heat from heat-generating equipment or draught air such as in a garage; - the Products are moved from their original installation location; - the Products are not stored, installed, commissioned, charged, operated and maintained in accordance with the technical instructions as per the operating instructions; - the Sony battery module was not kept within a specific temperature range (see table). The battery manufacturer can check the temperature of the Fronius Battery Module and is able to determine whether the required temperature has been maintained throughout the entire service life. - the warranty claim is not submitted immediately and no later than 14 days after the occurrence of abnormalities that may lead to a warranty claim as defined above, in writing by e-mail to Fronius. In addition, the	replacement Products or through repair of the Products.  The unexpired portion of the Warranty Period will apply to the replaced or repaired Products. Replacement or Repair of Products under the terms of the warranty does not provide the right to a renewal of the Warranty Period.				and remedies of the consumer that are stipulated by law, and which are not affected by this manufacturer's warranty. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.	

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
							includes repair or replacement in the scenarios listed below (see table).  Overview of warranty product, warranty service and warranty period: Fronius Solar Battery Warranty services from dispatch from Fronius factory Fronius Warranty Plus Warranty services from dispatch from Fronius factory 2 years Free warranty extension available if registered at <a href="http://www.solarweb.com">www.solarweb.com</a> within 30 months of dispatch from the Fronius factory / Fronius Warranty Plus: to 5 years for the Fronius Solar Battery plus with monthly internet connection between Fronius Solar.web and the Fronius Solar Battery, Fronius			<p>purchaser must – following prior consultation – ensure that SONY or Fronius representatives have access to the installed Products during usual business hours for the purpose of inspection in order to fulfil the warranty claim.</p> <p>The warranty does not apply to Products that:</p> <ul style="list-style-type: none"> <li>- have been modified or used with components not authorised by SONY;</li> <li>- have been physically damaged;</li> <li>have been improperly, negligently or inappropriately handled in any other manner;</li> <li>- are damaged with regard to their functionality due to external influences for which SONY is not responsible, such as a natural disaster, including floods and storms (force majeure);</li> <li>- have exceeded 5475 charging cycles. Cycles can be checked either via the inverter or web server, whereby one cycle corresponds to a complete discharge and recharge;</li> <li>- relate to a Fronius hybrid inverter as the warranty product and which has spent more than 15% of its operating hours being used</li> </ul>						

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards	
							<p>capacity guarantee: to 15 years for Sony battery module **) Fronius Warranty: to 7 years Warranty extension can be purchased from your installer within 30 months of dispatch from the Fronius factory *) Fronius Warranty or Fronius Warranty Plus / to 10 years</p> <p>The warranty begins from the date of dispatch from the Fronius factory and ends two (2) or fifteen (15) years after the purchase date ("Warranty Period"). In order to determine the date of the initial purchase, the purchaser must keep the original sales receipt for the entire Warranty Period and must present this to SONY on request.</p>			in emergency power mode. This condition applies after the hybrid inverter has spent 1500 hours operating in emergency power mode.							



Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
GCL System Integration Technology Co., Ltd	E-KwBe NC/S 2.5kWh and E-KwBe NC/S 5.6 kWh	6 January 2017 <sup>113</sup>	Lithium-Ion (NMC)	E-KwBe NC/S 2.5kWh/1.5kW E-KwBe NC/S 5.6 kWh/3kW	2,555 cycles @ 100% DoD	Operating temperature: 0-45 °C Ambient temperature: Must not exceed 50°C Humidity: 25-95 %	7 years “Warranty Starting Date” of a Product shall mean the invoicing date indicated on the invoice(s) issued to the Customer for the acquisition of the Product. If there are more than one invoices issued for the Product, Warranty Starting Date shall mean the earliest invoicing date on any of those Products.	GCL System Integration Technology Co., Ltd (“GCLSI”) provides performance warranty for the Products as described in detail below (hereinafter collectively referred to as “Limited Warranty”).  GCLSI provides to the Customer the below Limited Warranty with respect to the capacity of the Product (the “Warranted Capacity”): (i) The Product shall have not less than 87% of its Nominal Capacity measured under Standard Measurement Condition within 2 years from the Warranty Starting Date; and (ii) The Product shall have not less than 75% of its Nominal Capacity measured under Standard Measurement Condition within 7 years from the Warranty Starting Date.  For the avoidance of any possible doubt, the Limited Warranty provided by GCLSI does not cover any cosmetic changes or defects, normal noise or vibration, normal wear and tear, to the extent it does not result in the Product’s performing below the applicable Warranted Capacity	3.1.Warranty claim(s) will only be accepted when being put forward within the applicable warranty period. Without prejudice to the foregoing, warranty claim(s) shall be made within 21 days upon the Customer because aware or should have been aware of the under performance of the Products. 3.2.If the Customer has a justified warranty claim covered by the Limited Warranty, an immediate notification shall be filed directly (i) to GCLSI, by mailing a registered letter in writing, or sending an email to GCLSI’s email account listed hereunder; and (ii) to the vendor from whom the Customer purchased the Products. Together with the notification, the Customer shall provide: (i) the name and address of the Customer (and its distributor and installer, where applicable); (ii) evidence showing the Product has been under-performing; and (iii) other documents, evidence, or information as may be required by GCLSI or the agent appointed by GCLSI to deal with such warranty claim. 3.3.GCLSI or approved agent of GCLSI will examine the evidences and documents provided by the Customer and may request the Customer to deliver the allegedly defective Products to be designated by GCLSI or GCLSI’s approved agent for further examination, inspection and verification. 3.4.After examination, inspection and verification of relevant evidences (and Product(s), where applicable): (i) if GCLSI or approved agent of GCLSI determines that it has been substantiated that the Products are performing below the applicable Warranted Capacity, before GCLSI or approved agent of GCLSI would be obligated to	2. The Limited Warranted shall not be applicable, if: (1) any one of the below conditions or prerequisites is not satisfied or met: (A) The ambient temperature during the operation of the Product must not fall below 0 oC or exceed 45 oC ; and (B) The Product(s) must not be exposed to a temperature exceeding 50 oC ; and (C) The Product(s) has been and will be configured for rapid daily cycles use; and (D) The installation of the Product(s) has been or will be completed within twelve (12) months from the date of manufacturing date of the Product(s); or (2) the Product(s) is subject to accident or inappropriate transportation, storage or handling; (3) the Product(s) is subject to non-observance of GCLSI’s installation manual or maintenance instruction; (4) the Product(s) is subject to operation, reparation, maintenance, modification or alteration by someone other than an approved technical of GCLSI; (5) the Product(s) is	1.4.In a case where the actual capacity of the Product is below the aforementioned Warranted Capacity, owing to any significant defects in materials and workmanship, GCLSI may judge, at its sole discretion, and at its option either to repair or replace the defective Product with a new or refurbished Product. 1.5.In the event the Product is no longer available in the market, GCLSI may, at its option, replace it with a different product with equivalent functions and performance or refund the remaining annually depreciated value of the purchase price over the term of Limited Warranty beginning from the date of invoice. 1.6.These remedies set forth in this Article 1 (Limited Warranty) shall be the sole and exclusive remedies under the Limited Warranty and shall not extend the original warranty period of the Limited Warranty	The Limited Warranty is extended to and only extended to the end customer that has acquired the Products for the purpose of on-site use (the “Customer”). The Limited Warranty cannot be transferred without prior written consent from GCLSI.	The limited warranty as set forth herein is expressly in lieu of and excludes all other express or implied warranties, including without limitation warranties of merchantability and of fitness for particular purpose, use or application, and all other obligations or liabilities on the part of GCLSI, unless such other obligations or liabilities are expressly agreed to in writing signed and approved by GCLSI. GCLSI shall have no responsibility or liability whatsoever for damages or injury to persons or property, or for other loss or injury resulting from any cause whatsoever arising out of or related to the modules, including without limitation, any defects in the products, or from use or installation. Under no circumstances shall GCLSI be liable for incidental, consequential or special damages, howsoever caused, even if advised of possibility of	Not stated	No	Not stated

<sup>113</sup> GCL System Integration Technology Co., Ltd, *Limited Warranty for E-KWBE Energy Storage System* (6 January 2014) <http://en.gclsi.com/wp-content/uploads/2017/01/E-KwBe-NCS-Warranty-EN.pdf>

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
									perform relevant warranty obligations pursuant to the Limited Warranty, the Customer will be required to immediately furnish to GCLSI or approved agent of GCLSI the original invoice(s) issued to the Customer when the Customer purchased the Product(s) concerns. (ii) If GCLSI or approved agent of GCLSI determines that the result has indicated that the Product(s) has been performing in conformity with the applicable Warranted Capacity, the Customer shall be obligated to reimburse GCLSI and approved agent of GCLSI the costs and expenses incurred by them in relation to such testing, examination and verification. 3.5.No warranty claim(s) will be honored if: (i) The type or serial number of the Products have been altered, removed or been made illegible; or (ii) The Customer fails to provide to GCLSI the original copies of: (1) a full set of invoices issued by the vendor to the Customer for the Customer's purchase of the Products involved in the warranty claim(s); (2) the warranty certificate issued by GCLSI; and (3) other evidence, information, document and datas that GCLSI might request the Customer to provide, to assess the actual performance of the Products; and (iii) a valid warranty claim is not submitted to GCLSI within 10 days after relevant applicable warranty period.	subject to any change or attempt to change the life of the Product or any improve or attempt to improve the Product, without prior written consent from GCLSI; (6) the Product(s) is subject to any damage due to abnormal operation environment or other reasons; (7) the Product(s) was or is removed, reinstalled, relocated or otherwise altered from its original installed location; (8) the Product(s) is or was applied to non-intended uses; the Product(s) is subject to force majeure events or inverts, including but not limited with lightning, flood, fire, earthquake, extreme hot or cold whether etc.; or (9) the Product(s) is subject to other incidents or events that are beyond GCLSI's reasonable control.			such damages. Loss of use, loss of profits, loss of production, any loss of revenues are specifically and without limitation excluded.			
LG Chem, Ltd	RESU3.3, RESU6.5, RESU10	11 January 2017 <sup>114</sup>	Lithium-ion (NMC)	RESU3.3: RESU6.5: 6.5kWh/5.9kWh RESU10:	3,200 cycles at 90% DoD	The ambient temperature during the operation of the Products shall not fall	10 years from the initial installation date.	3. Performance Warranty (Standard) LGC warrants and represents that the Product retains at least 60% of Nominal	6. Claim Payment Policy Claims under this Warranty must be made by notifying the Authorized Reseller from whom the Product was	2-3. Exclusion of Warranty  Damage to the Products resulting from	2-2. Limitation of Warranty scope LGC's liability under this Warranty shall be limited to replacement, repair, refund and compensation. Replaced or	No "This warranty only applies to the Buyer who have purchased the Products for their own use."	Not stated	This Warranty is subject to the law of Australian State.	Yes - Products come with guarantees that cannot be excluded	Cell UL1642 Product CE / RCM / TUV (IEC 62619) / UL1973

<sup>114</sup> LG Chem Ltd, *LG Chem Lithium-ion Battery Limited Warranty: RESU3.3 / RESU6.5 / RESU10 Battery Storage System*, (11 January 2017) SolarQuotes [http://www.solarquotes.com.au/blog/wp-content/uploads/2017/01/20170111-RESU3.3\\_6.5\\_10-LG-Chem-Lithium-ion-Battery-Limited-Warranty-AU.pdf](http://www.solarquotes.com.au/blog/wp-content/uploads/2017/01/20170111-RESU3.3_6.5_10-LG-Chem-Lithium-ion-Battery-Limited-Warranty-AU.pdf)

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards	
				9.8kWh/8.8kWh		below -10°C or exceed 45°C		<p>Energy for the either 10 years after the date of the initial installation or for a minimum Energy Throughput as per the table below (whichever comes first) when the battery system is operated under a normal use followed by the specification and the manual provided by LGC. The term "Nominal Energy" herein means the initially rated capacity of the Products as printed on the label of the Products. The precondition of the valid 10 year Performance Warranty shall be as follows: (i) The ambient temperature during the operation of the Products shall not fall below -100C or exceed 450C (ii) The energy throughput is less than values in table below:</p> <p>Product Name Nominal Energy Energy Throughput</p> <p>RESU3.3 3.3kWh 10.0MWh</p> <p>RESU6.5 6.5kWh 20.0MWh</p> <p>RESU10 9.8kWh 30.0MWh</p>	<p>purchased. For a Warranty Claim to be processed, it must include following items; (1) Proof of the original purchase (2) Description of the alleged defect(s) from authorized service center (3) The relevant Product's serial number and the initial installation date Buyers who are unable to contact the Authorized Reseller from whom the Product was purchased should contact LGC at the Q&amp;A page of the LGC Partner Website <a href="http://www.lgesspartner.com">http://www.lgesspartner.com</a></p>	<p>any of following activities is NOT covered by this Limited Warranty:</p> <ul style="list-style-type: none"> <li>Improper transportation, storage, installation or wiring by Buyer</li> <li>Modification, alteration, disassembly, repair or replace by someone other than a personnel certified by LGC</li> <li>Noncompliance with LGC's official installation manual</li> <li>External influences including unusual physical or electrical stress (power failure surges, inrush current, lightning, flood, fire, accidental breakage, etc.)</li> <li>Use of an incompatible inverter, rectifier or PCS.</li> </ul>	<p>repaired Products shall be warranted for the remainder of the original Term of Performance Warranty. In any event, the replacement shall not justify the renewal of the Term of Performance Warranty.</p> <p>About Service Products/Parts Service products/parts are able to be used as new or refurbished condition which performance is equal to or higher than defective Products and guaranteed by LGC. In the event the Products are not available in the market anymore, LGC, at its option, may replace it with different kind of product with equivalent functions and performances or refund the remaining annually depreciated value of the purchase price of the Products during the Term of Performance Warranty as the Compensation Scheme below. The purchase price mentioned hereinabove means the list price actually paid by the Buyer for the purchase.</p> <p>Compensation Scheme - CLASS I : 100% of the purchase price from the initial installation date to 24th month CLASS II : 72% of the purchase price from 25th to 36th month CLASS III : 58% of the purchase price from 37th to 48th month CLASS IV : 44% of the purchase price from 49th to 60th month CLASS V : 30% of the purchase price from 61st to 72nd month CLASS VI : 16% of the purchase price from 73rd to 84th month CLASS VII : 6% of the purchase price from 85th to 96th month CLASS VIII: 4% of the purchase price from 97th to 108th month CLASS IX : 2% of the purchase price from 109th to 120th month</p> <p>No warranty of performance will be provided from the 121st month</p>					under the Australian Consumer Law. The Buyer is entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. The Buyer is also entitled to have the goods repaired or replaced if the Products fail to be of acceptable quality and the failure does not amount to a major failure. The benefits to the consumer given by the warranty are in addition to any other rights and remedies of the consumer under a law in relation to the goods or services to which the warranty relates.	

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Pylon Tech	US2000B	Not stated <sup>115</sup>	Lithium Iron Phosphate	2.4kWh/1.92kWh	6,000 cycles at 80% DoD	Operating temperature range: -10°C to 50°C	Product warranty runs for 120 months (if registered) or for 60 months (if not registered).  The product warranty date starts from one of the following date which is prior to the other: 1. The system registration date 2. Six months after date of manufacture.  Note: the warranty period will be end within 60 months after the leaving date of product from Pylontech factory when any failures to register online happen.	Pylontech guarantees the material and performance of its products being free of defects and the capacity retention being not less than 80% within 120 months (hereof refer to "products warranty period")	To benefit from the warranty, customers must successfully register and fulfill the information online at their website.  The products which are guaranteed should be installed operated and maintained according to the specifications identified in the products installation manual [...] and be free of any damage.  Accumulated discharge energy should not be more than 350 times of Nominal Energy per year. The warranted usable energy will be adjusted every year if the customer fails to fulfill such requirement according to the following conditions: Yearly Use Rate [%] = (Accumulated Energy-14000Ah) / 14000Ah x 100% (14000 Ah=350x50Ahx80%)  - If 0% < Use Rate < 10%, then the warranted usable energy will be reduced by Use Rate X 0.3;  - If 10% ≤ Use Rate < 20%, then the warranted usable energy will be reduced by Use Rate X 0.5;  - If 20% ≤ Use Rate < 30%, then the warranted usable energy will be reduced by Use Rate X 1.0;  - If 30% ≤ Use Rate, then the warranted usable energy will be reduced by Use Rate X 1.5.  Pylontech should be informed within 48 hours via email to calling in case of any products problems or defects that should be claimed for warranty. The root analysis is necessary during claim and the final verification should be decided by Pylontech. For a warranty claim, following documents are required: 1) Register number and	No liabilities would be taken by Pylontech for products warranty if any indirect damages or defects caused by the following: 1. Installed with inverter which have not been tested by Pylontech;  2. Use of a inverter that fails to meet the requirements, such like the parameter of inverter is not compatible with battery including but not limited to peak voltage or current;  3. Battery damage caused by inverter failure;  4. Battery have not been recharged within 12 hours after low voltage production startup;  5. Battery has been treated improperly, negligently in any other inappropriate way, including use outside of recommended ambient condition, and the ambient temperature shall be in range of -10°C~50°C with the current limit: ■ 40~50°C: 10A charging and discharging; ■ 10~40°C: 25A charging and	In case of any failures to confirm to the above indications from the customer side with in the warranty period, Pylontech has the right to decide the way to offer the service of repair, or replacement with new or refurbished products.  The warranty of replacement and repaired product should be kept in line with the original warranty period. If any claiming products are not available in the market anymore because of improvement or updating, Pylontech has the right to replace with different kind of parts or components according to the latest technical standards. Compensation scheme based on original purchase price follows as: < 6 months, 100% of the purchase price; < 12 months, 75% of the purchase price; < 24 months, 55% of the purchase price; < 36 months, 35% of the purchase price; < 48 months, 25% of the purchase price; < 60 months, 15% of the purchase price; < 72 months, 12% of the purchase price; < 84 months, 7% of the purchase price; < 96 months, 4% of the purchase price; < 108 months, 2% of the purchase price; < 120 months, 1% of the purchase price; ≥ 120 months, out of warranty.	Not stated	Except as herein expressly stated, there are no warranties or conditions beyond the law. The parties (Pylon and resellers partners or customers) agree the warranty hereof. In no event, Pylontech should be liable for any special, incidental or consequential damages of any nature advised of possibility of such damages	Not stated	No	Not stated

<sup>115</sup> Pylon Technologies Co Ltd, Lithium-Iron Phosphate Battery US2000B Product Manual, <http://www.s-power.cz/wp-content/uploads/pylontech-us2000b-manual.pdf>

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									<p>battery serial number; 2) Faulty description: a. Is the RUM light flashing or off? b. Is the ALM light on or off? c. Battery can be charge/discharge or not?</p>	<p>discharging;            ■ 0~10°C: 10A charging and 25A discharging;            ■ -10~0°C: no charging and 5A discharging;</p> <p>6. Damage in transporting, including but not limited by dropping, trampling, deforming, impacting or spearing with a sharp items;</p> <p>7. Storage, installation, commissioning, modification or repair of the product, or opening of the external casing of the product, that is performed by anyone other than Pylontech or a Pylontech's certified installer;</p> <p>8. Abuse, misuse, negligence, accidents or force majeure events, including but not limited to lightning, flood, fire, extreme cold weather, or other events outside the reasonable control of Pylontech;</p> <p>9. Any attempt to extend or reduce the life of the product without any written confirmation from Pylontech, whether by physical means, programming or others;</p> <p>10. Removal and reinstallation at another place</p>						

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										<p>from the original installation without the written confirmation from Pylontech;</p> <p>11. Damaged by water, conductive dust or corrosive gas;</p> <p>12. Battery have been disassembled;</p> <p>13. Battery have been connected with different type battery modules;</p> <p>14. Battery have been connected with battery not from Pylontech.</p> <p>15. Faulty claims without warranty card, serial number or enough faulty description;</p> <p>16. Failure to install, operate or maintain the product in accordance with the safety precautions, Installation guide or use manual.</p>						
Redflow	ZBM2	27 January 2017 <sup>116</sup>	Flow (Zinc-Bromide)	10kWh/10kWh	3,650 cycles at 100% DoD	Operating electrolyte temperature range of 15°C to 50°C (59°F to 122°F), ZBM2 can typically operate at ambient temperatures outside this range for extended periods	Defects: 12 months from the date of delivery  Performance: 10 years from date of delivery or 36,500kWh of energy delivered, whichever comes first.	Defects guarantee: Redflow guarantees to the Customer that the ZBM2 product which is installed, used and serviced in accordance with the relevant product information will be free from defects in material and workmanship for a period of twelve months from the date of delivery to the Customer.  Performance guarantee: Redflow warrants the performance of the ZBM2 product to the	The ZBM2 product must be checked for visible defects on delivery. Any defects discovered during this process must be reported to Redflow immediately. If visible defects are not reported immediately, Redflow may refuse to honour the Defects Guarantee and Performance Warranty.  This performance warranty applies [...] only when the ZBM2 product is used in accordance with the manufacturer's operating instructions as defined in the ZBM2 product Installation and Operation	Redflow is entitled to refuse to honour the Defects Guarantee and Performance Warranty in the following circumstances (regardless of how the circumstances arise): • Where the ZBM2 product has been handled, or modifications made to the battery, not in accordance with	Defects guarantee: In the event that the ZBM2 product has a defect covered by this guarantee (Defective Product), Redflow, at its discretion will (i) remedy the defect, (ii) supply a replacement ZBM2 product, or (iii) repay the purchase price of the Defective Product.  Performance guarantee:  Should Redflow find that a ZBM2 product does meet the Performance Warranty terms and conditions, it will repair or replace the ZBM2 product or refund the amount paid (at Redflow's	No - Customer is defined as the purchaser of the ZBM2 product from Redflow.	Yes - In no event shall Redflow be liable for consequential or incidental losses or damages. Redflow further disclaims all implied warranties of merchantability and fitness to the maximum extent permitted by law.	These warranty terms and conditions shall be exclusively governed by the laws of Queensland, Australia. The UN Convention on Contracts for the International Sale of Goods shall not apply. Customers irrevocably and	No	Not stated

<sup>116</sup> Redflow, Redflow ZBM2 Warranty Document (27 January 2017) SolarQuotes, <http://www.solarquotes.com.au/blog/wp-content/uploads/2017/01/Redflow-Warranty-Document-ZBM2-27-Jan-2017.pdf>

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								Customer for 10 years, or until the date on which an aggregate of 36,500 kWh of energy has been delivered by the ZBM2 (as measured by on-board system controller), whichever comes first.	<p>Manual.</p> <p>The Performance Warranty is subject to the conditions given by the Electrical Operating Envelope and the Physical and Communications Characteristics of the ZBM2 product as specified in the ZBM2 product Installation and Operation Manual. In addition, the following conditions must be met:</p> <ul style="list-style-type: none"> <li>• The ZBM2 product delivers a maximum of 100% of kWh per 24 hour period.</li> <li>• If the ZBM2 product indicates that it has reached end-of-life, the ZBM2 product must no longer be used.</li> <li>• In the event of a warranty claim, full and complete operational logs of ZBM2 product data (as specified in the ZBM2 product Installation and Operation Manual) are to be provided to Redflow for analysis.</li> <li>• Servicing of ZBM2 products can only be conducted by Redflow or Redflow-approved personnel.</li> <li>• Redflow must have remote access to the ZBM2. If the ZBM2 is not connected to the internet within 30 days following its installation, or if the internet connection to the ZBM2 is interrupted and is not subsequently restored within 30 days, then the end date of the Performance Warranty will reduce to the earlier of 4 years from the date of delivery, or the date on which an aggregate of 14,600 kWh of energy has been delivered by the ZBM2 (as measured by on-board system controller), whichever comes first, unless alternative performance monitoring arrangements are negotiated and agreed in writing with RedFlow.</li> <li>• This warranty is applicable on a return to supplier basis for the ZBM2 product only.</li> </ul>	<p>the relevant product information (including the Installation and Operation Manual or other written instructions issued by Redflow);</p> <ul style="list-style-type: none"> <li>• Where the ZBM2 product has not been installed in accordance with the Installation and Operation Manual or other written instructions issued by Redflow;</li> <li>• Where the system containing the ZBM2 product has been incorrectly configured;</li> <li>• Where the ZBM2 product has not been serviced or maintained in accordance with the relevant product information or written instructions issued by Redflow;</li> <li>• Where the ZBM2 product has been used for purposes or in circumstances not conforming to the product specifications or not in compliance with the Installation and Operation Manual;</li> <li>• Where the ZBM2 product has been damaged due to external or environmental causes of any kind (including pollution of any kind, fire, explosion, smoke, charring,</li> </ul>	discretion) and the warranty term remains as the balance of the original warranty.			unconditionally submit to the exclusive jurisdiction of the courts of Queensland, Australia and any courts which have jurisdiction to hear appeals from any of those courts and waives any right to object to any proceedings being brought in those courts.		

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									<ul style="list-style-type: none"> <li>• Redflow reserves the right to perform any tests prior to considering any warranty claims.</li> </ul>	lightning, hail, frost, snow or storms); <ul style="list-style-type: none"> <li>• Where the ZBM2 product has been damaged due to malicious acts by any person (including vandalism or violent activities);</li> <li>• Scratches, marks, mechanical wear, rust, mould, degradation, discolouration and other changes which occur after the delivery of the ZBM2 product but which do not result in a reduction of performance which exceeds the levels set out in the Performance Warranty Conditions;</li> <li>• Where the ZBM2 product is modified or used in processes involving, or in conjunction with, other products without Redflow's prior written consent; and/or</li> <li>• Where the ZBM2 product has been damaged during shipping or transportation after title has passed from Redflow, other than shipping or transportation conducted: (i) by Redflow or (ii) with Redflow's prior written consent and in accordance with the relevant product information (including the Installation and</li> </ul>						



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										Operation Manual and/or other written instructions issued by Redflow).						
Samsung SDI	Scalable (7.2 kWh/10.8 kWh) All in One system	September 2015 <sup>117</sup>	Lithium Ion (Lithium Manganese Oxide)	7.2kWh/6.8kWh 10.8kWh/ 9.72kWh	90 % (6000 cycles, 5 ~ 95%)	Operating: -10~40° C  Ambient: -20~60° C  Humidity: 95 % (non-condensing)	The warranty period of the Product ("Product Warranty Period") is specified as follows : The warranty period shall be five (5) years from the Date of Installation  Note that the "Date of Installation" is defined as follows: To claim any warranty hereunder, End-User must provide the date of installation. If End-User is unable to submit any proof of the Date of Installation, Samsung SDI will calculate the Product Warranty Period from the manufacturing date which is written on the Product's label.	I. Product Warranty 1. Samsung SDI and Samsung SDI Europe GmbH (in the following referred to as "Samsung SDI") warrant that the Product1 will (i) be free from defects in material and workmanship under normal use and (ii) conform to the applicable Technical Specifications for the Product.  II. Performance Guarantee 1. In addition to the Product Warranty, Samsung SDI guarantees performance of the Product to be maintained at least sixty five percent (65%) of initial battery's capacity for a period of ten (10) years after the Installation Date or until the end of 6,000 cycles of the Products, whichever occurs earlier "(Performance Guarantee Period)", provided that the usage of the Product shall have complied with the Operating Conditions under specification. 2. About Self Discharging Degradation, Samsung SDI guarantees 180days after ex-work for the Performance Guarantee Period.	III. Limitation of Warranty 1. The warranties set forth hereunder shall not apply to Products which, in Samsung SDI's absolute judgment have been subjected to: misuse, abuse, neglect or accident; alteration, improper installation, application or removal (including but not limited to any installation, application, repair, service or removal by any party not authorized in writing or text form by Samsung SDI); non-observance of Samsung SDI's installation, users and/or maintenance instructions; repair or modifications by someone other than a service technician approved by Samsung SDI ; power failure surges, lightning, flood, fire, accidental breakage or other events outside Samsung SDI's control. Further, no warranty shall apply to any damage caused by unauthorized goods to Samsung SDI's Products are incorporated or installed into, or used together with, including any parts thereof. Customers of Samsung SDI's Products shall be fully aware that the Products are intended for individual operation. Connecting other product or products in parallel with Samsung SDI's Products may result in abnormal operation. For the avoidance of doubt, it shall be clarified that this shall not restrict the End-User from incorporating or installing the Products in combination with products or in systems offered by The End-User. 2. End-User shall promptly (but in any event within fifteen (15) days after obtaining notice	3. This warranty does not apply to batteries that - are not operated in accordance with the operating manuals for their intended purpose; - have been incorrectly installed or commissioned; - have been modified, altered or operated with other components not approved by SAMSUNG SDI; - have been physically damaged (e.g. damage from falls, from transportation); - have been damaged by force majeure (e.g. flash of lightning, overvoltage, storm, fire); - have been treated improperly, negligently in any other inappropriate way (including use outside of the recommended ambient conditions).	3. In the event that the Product fail to conform to the above warranty during the Product Warranty Period, Samsung SDI shall, at Samsung SDI's option: (i) repair the non-conforming or defective Product; or (ii) provide End-User with a replacement for the Product without undue delay, within 7 working days in Germany, for the other countries within 7 working days plus delivery dates.. Samsung SDI shall be responsible for all reasonable costs of repair or replacement in connection with such non-conforming or defective Product; whereas the End-User shall bear the costs of removing the non-conforming or defective Product(s) and (re) installation of the repaired or replaced Product if the non-conformance or defect of the Product is attributable only to the End-User. Any defects in products arising from End-User's misuse, natural disaster, unauthorized change or repair, or abnormal installation environment shall be repaired or replaced at End-User's cost (Refer Article 4).	Yes - The warranty provided hereunder is only applicable to the EndUser who has purchased Products. The End-User shall not assign the warranty without prior written consent by Samsung SDI. Notwithstanding the foregoing, the warranty provided hereunder is transferable to a subsequent owner of the Products, provided that Samsung SDI is informed in writing within a reasonable time of the sale of the subsequent owner's name and contact details. The notice should identify the name of the previous owner of the Products, place and date of the purpose, model, make and serial number of the Products. The effective transfer of the warranty does not otherwise alter the terms of the warranty provided hereunder.	Yes - 4. Except as specified above, all express or implied conditions, representations, and warranties including, without limitation, any implied warranty or condition of merchantability, fitness for a particular purpose, non-infringement, satisfactory quality, non-interference, or arising from a course of dealing, law, usage, or trade practice, are hereby excluded to the extent allowed by applicable law and are expressly disclaimed by Samsung SDI.  To the extent an implied warranty cannot be excluded, such warranty is limited in duration to the express warranty period. This disclaimer and exclusion shall apply even if the express warranty set forth above fails of its essential purpose.	Not stated	No	Yes - IEC62109-1/2 AS/NZS 3100, AS4777.2/3, CE

<sup>117</sup> Samsung SDI, ELSR722-00004 / ELSR103-00001: Scalable All in One User Manual (September 2015) RFI Wireless [http://www.rfiwireless.com.au/media/PDFs/ELSR722-00004\\_UM\\_R1.0\\_Eng\\_150914.pdf](http://www.rfiwireless.com.au/media/PDFs/ELSR722-00004_UM_R1.0_Eng_150914.pdf)

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									<p>or knowledge thereof) notify Samsung SDI of any defect or other nonconformity with any of the Product Warranty identified by End-User by delivering written notice (whereas telefax or email shall be sufficient) to Samsung SDI of a warranty claim. Samsung SDI shall promptly notify End-User of any defect or other nonconformity with any of the Product Warranties identified by Samsung SDI. Any installation defects, however, shall be identified by the Installers who installed the Products in the first place. Samsung SDI can send its engineers to the installation site upon request, however, to identify the purported defect upon request, provided that any cost incurred is to be paid by Installers.</p> <p>6. Since Samsung SDI's Products are intended to be operated with Internet connection, web registration of the Products is required. (Ask to Installer) Remote control of the Products is achieved only when the Products are connected to the Internet, including but not limited to, monitoring of the Product operation and updating of firmware. The Products are able to be operated without Internet connection (i.e. Stand-Alone mode), however, Warranty herein may not fully cover the Products that are not registered on the web and operated without Internet connection.</p>			5. In no event will Samsung SDI be liable for any consequential, special, incidental, indirect, or punitive damages, including without limitation lost profits, whether the claim is based on contract, tort, strict liability, or any other theory of law or equity, even if advised of the possibility of such damages. Samsung SDI's liability from any cause whatsoever shall in no event exceed the amount of the purchase price paid by end-user to Samsung SDI for such product giving rise to the liability.				
SimpliPhi Power, Inc (Company registered in Delaware)	PHI2.6, PHI3.4	6 September 2016 <sup>118</sup>	Lithium Iron Phosphate	PHI3.4 3.4kWh/2.75kWh	Equivalent to 80% Retained Capacity	Operating Temperature Range Per Warranty: • -50°C to 49°C for 5,000 cycles • 0°C to 43°C for 10,000 cycles	The SimpliPhi Power PHI2.6™ and PHI3.4™ Smart-Tech Battery (the "SimpliPhi Product") as supplied	Manufacturing defects and workmanship	This Limited Warranty applies only to a SimpliPhi Power Product (a) purchased from SimpliPhi Power Inc. or an authorized SimpliPhi Power distributor, dealer or reseller and (b) installed by a licensed professional. In the event you rent or	This limited Warranty does not cover faults in design or installer error such as reverse polarity or misuse of system wide equipment or inaccurate	The liability of SimpliPhi Power under this Limited Warranty shall be limited to the repair or replacement of the SimpliPhi Power Product, at SimpliPhi Power's sole discretion. If the SimpliPhi Power Product is found to be defective as a	This Limited Warranty applies only to the original end-use purchaser of the SimpliPhi Power Product and is transferable only if the SimpliPhi Power Product remains installed in the Original Use Location.	This Limited Warranty is the exclusive warranty applicable to the SimpliPhi Power Product. SimpliPhi Power expressly	Not stated	No	Not stated

<sup>118</sup> SimpliPhi Power, Inc, 10 Year Limited Warranty: PHI2.6, PHI3.4 (6 September 2016) DPA Solar [http://dpasolar.com.au/media/mconnect\\_uploadfiles/S/i/SimpliPhi%20Power%20Inc.%20Warranty.pdf](http://dpasolar.com.au/media/mconnect_uploadfiles/S/i/SimpliPhi%20Power%20Inc.%20Warranty.pdf)

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						<p>(Note differing figures between the data specification sheet and the warranty document)</p> <p>and distributed by SimpliPhi Power, Inc., a Delaware corporation, is warranted (the "Limited Warranty") by SimpliPhi Power, Inc. against manufacturing defects in materials and workmanship for a period of ten (10) years (the "Limited Warranty Period") or for 10,000+ cycles on a prorated basis, whichever comes first, when installed and operated within the SimpliPhi Guide for Operating Parameters.</p> <p>The term of this Limited Warranty (i) begins on the original date of purchase of the SimpliPhi Product as indicated on the Limited Warranty Registration Card submitted to SimpliPhi Power and (ii) continues through the Limited Warranty Period.</p> <p>The Warranty</p>		<p>lease the SimpliPhi Power Product, no end-user purchase takes place; therefore, this Limited Warranty does not apply and you must contact your rental or leasing company to determine whether Warranty coverage is applicable.</p>	<p>programming of all ancillary equipment in your system. This Limited Warranty does not apply to the SimpliPhi Power Product or any SimpliPhi Power Product part (i) if the SimpliPhi Power Product has logged in excess of 10,000+ cycles or a period of 10 years or (ii) if the SimpliPhi Power Product or any SimpliPhi Power Product part has been modified or damaged by the following:</p> <ul style="list-style-type: none"> <li>• Installation or Removal</li> <li>• Alteration or Disassembly</li> <li>• Normal Wear and Tear</li> <li>• Accident or Abuse (Being Dropped, etc.)</li> <li>• Corrosion - Inappropriate Environmental Exposure</li> <li>• Repair or Service Provided by an Unauthorized Repair Facility</li> <li>• Lightning</li> <li>• Operation Contrary to Manufacturer Product Instructions</li> <li>• Fire, Flood or Acts of God</li> <li>• Excessive Heat or Cold Conditions</li> <li>• Water Damage</li> <li>• Shipping or Transportation</li> <li>• Incidental or Consequential Damage Caused by Other Components of the Power System Including but not Limited to Inverters, Charge Controllers,</li> </ul>	<p>result of any manufacturing defect in materials and workmanship during the Limited Warranty Period, SimpliPhi Power will, at its sole discretion either (i) repair the SimpliPhi Power Product or (ii) replace the SimpliPhi Power Product. If a SimpliPhi Power Product is replaced, that SimpliPhi Power Product will become the property of SimpliPhi Power and must be returned to SimpliPhi Power free of any third-party ownership claims.</p> <p>This Limited Warranty does not cover the cost of installation, removal, shipping or reinstallation.</p>		<p>disclaims any other express or implied warranties of the SimpliPhi Power Product, including but not limited to any implied warranties of merchantability or fitness for a particular purpose. No warranties whether expressed or implied, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose shall apply after the Limited Warranty Period. SimpliPhi Power also expressly limits its liability in the event of a product defect to repair or replacement in accordance with the terms of this Limited Warranty, and exclude all liability for incidental or consequential damages, including without limitation any liability for the SimpliPhi Power Product not being available for use or lost revenues or profits, even if SimpliPhi Power has been advised of the potential for such damages. Some states (or jurisdictions) may not allow the exclusion</p>				

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							period of any repaired SimpliPhi Power Product or its replacement is twelve (12) months from the date of shipment from SimpliPhi Power, or the remaining term of the Limited Warranty Period, whichever is greater.			Breakers, Bypass Switches, Fuses, etc <ul style="list-style-type: none"> <li>Any Product Whose Serial Number has been Altered, Defaced or Removed</li> <li>Operation in a Non-Intended Use, or a Use Which Exceeds the Recommended or Permitted Limits or Loads of the SimpliPhi Power Product.</li> </ul>			or limitation of certain warranties or damages, so some of the above exclusions may not apply to you. If there is any inconsistency between this Limited Warranty and any other agreement or statement included with or relating to the SimpliPhi Power Product or services, this Limited Warranty shall govern. If any provision of this Limited Warranty is found invalid or unenforceable, it shall be deemed modified to the minimum extent necessary to make it enforceable and the remainder of this Limited Warranty shall remain valid and enforceable according with its terms.  CONSUMER PROTECTION AND OTHER LAWS MAY APPLY Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations or			

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													<p>exclusions may not apply to you. Some states may provide for additional warranty rights and remedies, and the provisions contained in this Limited Warranty are not intended to limit, modify, take away from, disclaim or exclude any mandatory Warranty requirements provided by states, including certain implied Warranties. This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Your acceptance and use of the SimpliPhi Power Product constitutes acceptance of the terms, conditions and limitations of this Limited Warranty. The terms, conditions and limitations of this Limited Warranty will supersede any other agreement or document relating to the subject matter hereof, including, but not limited to, the terms and conditions that are part of a purchase order covering the SimpliPhi Power Product</p>			

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													or other document sent to SimpliPhi Power by you relating to the SimpliPhi Power Product.			
Sonnen Australia Pty Limited	sonnenBatterie	Not stated <sup>119</sup>	Lithium Iron Phosphate	16kWh/16kWh	10,000 cycles at 100% DoD	Operating temperature: 5°C to 40 °C	The warranty period commences on the date on which the sonnenBatterie is first brought into service as recorded on the Installation Certificate. The warranty period ends on whichever date occurs first: (a) 10 years from the commencement date of the warranty period; or (b) 10,000 complete recharge cycles of the sonnenBatterie.	Fault or defect warranty	Warranty claims must be made:  Within 6 months after the date on which the Customer became aware of the fault or defect, or after which the fault or defect became reasonably apparent; and  By no later than 3 months after the expiration of the warranty period.	The warranty does not cover: Any sonnenBatteries where: 1 it is not connected to the internet; 2 the lead-sealing of the battery has been damaged; 3 it has not been installed or repaired by sonnen or an Authorised Partner, as recorded on the installation Certificate; 4 it has been used or maintained other than in accordance with the sonnenBatterie's operating instructions or as set out in the technical data specification sheet provided with the sonnenBatterie; 5 regular examinations of the ordinary connection to the electricity network have not been carried out in accordance with sonnen's instructions; 6 it has been used with spare parts and accessories which do not comply with the original specifications issued by sonnen; or 7 software	If the sonnenBatterie develops a fault or defect during the warranty period, sonnen will repair or replace it. It may be replaced by a refurbished sonnenBatterie of the same type rather than being repaired. Refurbished parts may be used to repair the sonnenBatterie.  The decision whether to repair or replace the sonnenBatterie is at sonnen's sole discretion unless there is a 'major failure' as defined in the Australian Consumer Law.  Any physical repairs, replacement or collection of the sonnenBatterie will be performed by sonnen or its Authorised Partner as follows:  The repair, replacement or collection will be carried out from the place at which the sonnenBatterie was first delivered.  If the claim is covered sonnen will deliver any repaired or replaced sonnenBatterie back to the Customer.  If the claim is not covered sonnen will deliver the sonnenBatterie back to the Customer.  If the claim is not covered, the Customer will be responsible for any transport, travel and labour costs incurred in dealing with the claim.  If the claim is covered, sonnen will be responsible for any transport, travel and labour costs to a maximum amount of \$200.	The warranty is given by sonnen to the Customer in respect of the sonnenBatterie.  Customer is defined as the purchaser of the sonnenBatterie, for whose benefit the sonnenBatterie is brought into service and where the purchase is not for the purpose of resupply.  To the extent permitted by law, the warranty will not transfer to any subsequent purchasers of the sonnenBatterie without the prior written consent of sonnen.	Yes contained within the warranty conditions	Not stated	Yes - sonnen offers this warranty on top of any guarantees imposed by the Competition and Consumer Act 2010 and any other applicable State and Territory legislation.  As well as the sonnen warranty, the sonnenBatterie comes with guarantees that cannot be excluded under the Australian Consumer Law. The Customer is entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. The Customer is entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and	

<sup>119</sup> Sonnen Australia Pty Limited, *Manufacturer's Warranty* [https://sonnen.com.au/sites/default/files/warranty\\_-\\_sonnen\\_1510387\\_8\\_version.pdf](https://sonnen.com.au/sites/default/files/warranty_-_sonnen_1510387_8_version.pdf)

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										<p>updates as provided by sonnen from time to time have not been performed due to circumstances beyond sonnen's control;</p> <p>Negligence on the Customer's part;</p> <p>Normal wear and tear;</p> <p>Faults or defects caused by third parties, including work done by unauthorised service or repair agents;</p> <p>Damages caused by excess voltage within the main supply power network to which the sonnenbatterie is connected;</p> <p>Any incidental and consequential damages, loss of profits, loss of data a\or any other indirect damages;</p> <p>Any costs or expenses incurred by the Customer for the procurement of substitute equipment or services; or</p> <p>Any transport or travel costs incurred by the Customer in excess of \$200.</p>										
Sunverge Energy Australia Pty Ltd	Models SIS11.6 SIS19.4	December 2015 <sup>120</sup>	Lithium Iron Phosphate	11.6kWh/9.68kWh 19.4kWh/16.5kWh	7,000 cycles at 85% DoD	Operating: -20°C to 50°C	10 years from the date of installation	2. Warranty 2.1 Sunverge warrants that, for the Warranty Period, the Goods: (a) will be free from defects; (b) will be of merchantable quality;	This product warranty is given to any person who has acquired or otherwise owns a Good (you), but only if the Good has been installed in Australia after 1 April 2015, and applies	4. Exclusions and limitations 4.1 This product warranty does not apply if or to the extent that a defect is caused	3. Repair or replacement 3.1 If any Good is defective and, at your own expense, you give us notice of this including a description of the defect as soon as possible after you become	Unclear but it appears to be the case.	4.4 To the fullest extent permitted by law: (a) this product warranty applies to the	This product warranty is governed by and is be construed in accordance with the laws	Yes - If you are a consumer 5.1 To the extent that you have acquired the	Not stated				

<sup>120</sup> Sunverge Energy Australia Pty Ltd, *Product Warranty: Models SISA6048AX and SISA4548AX* (December 2015) AGL Solar <https://agsolar.com.au/wp-content/uploads/2015/12/Sunverge-Warranty-for-Australia.pdf>

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								and (c) will comply with all applicable laws	for 10 years from the date of installation (Warranty Period).	by: (a) non-observance of installation, commissioning, operation or maintenance instructions; (b) misuse, abuse, neglect or accident; (c) the Goods being installed in an unsuitable environment including, without limitation, any environment: (1) where there is insufficient ventilation; (2) where dirt, dust or debris builds up; (3) which is corrosive; or (4) where the Goods are exposed to fire, water, snow, moisture or liquid to an extent that exceeds the manufacturer's ratings; (d) any alteration, repair or modification of a Good not authorised by us; (e) non-compliance by any person other than us with applicable law; (f) power surges; (g) lightning, storm, flood, fire, earthquake or other act of God; (h) animals provided that, if the Good is installed in Queensland, that this exclusion does not affect our obligation under this product warranty to ensure that any enclosure for or forming part of a Good is vermin proof for Queensland conditions so as to prevent small animals and	aware of the defect and in any event before the end of the Warranty Period, then, also as soon as possible, we will repair the defect or remove the defective Good and supply and install a replacement Good. 3.2 To make a claim under this product warranty, send your notice to us as follows. We will then advise you on how we will handle the claim and the information you will need to give us to support the claim which will include evidence that you have acquired or own the relevant Good and as to the date of installation: Sunverge Energy Australia Pty. Ltd. Level 8, 757, Ann Street, Fortitude Valley, Brisbane. 3.3 This product warranty will apply to any replacement Goods under clause 3.1 provided that you must give any notice under clause 3.1 in respect of any such replacement Good before the end of the Warranty Period. 3.4 Title and ownership of any replaced Good passes to us.  4.3 The repair or replacement remedy provided for in clause 3 is your sole and exclusive remedy under this product warranty and is all that we are required to do under this product warranty.		exclusion of any other express or implied condition, warranty or guarantee with respect to the Goods including, without limitation, as to merchantability or fitness for particular purpose, and of any other obligation or liability on our part, unless such other condition, warranty, guarantee, obligation or liability is expressly agreed to by us in writing; (b) we have no liability for damage or injury to persons or property or for other loss or injury resulting from any cause whatsoever arising out of or relating to the Goods including, without limitation, any defects in the Goods, or from use or installation; (c) we have no liability to you for any consequential or indirect loss arising due to a breach of this product warranty, in tort (including negligence) or otherwise in connection with the Goods	of the State of Queensland.	Goods as a consumer (as defined in the Australian Consumer Law or other applicable consumer law): (a) the benefits given to you under this product warranty are in addition to other rights and remedies under the law; (b) our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure; (c) subject to clause 5.1(d), no exclusion or limitation contained in this product warranty will apply to the extent that it is	



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										insects (like geckos, termites, rodents, etc.) from entering into the enclosure; (i) events outside our control; or (j) fair wear and tear. 4.2 This product warranty also does not apply: (a) if the original nameplate, serial number, model number and other identification markings on a Good has been defaced, altered, or removed; (b) in respect of any consumable Good; (c) for any cosmetic shortcoming which does not impair the use of a Good; (d) if due to a change in applicable law the use of the Goods for your intended purpose is no longer permitted or is only permitted subject to applicable conditions or restrictions.			including, without limitation, liability for any loss of business operation, profits, anticipated income or anticipated cost savings; and (d) our total liability to you for a breach of this product warranty, in tort (including negligence) or otherwise in connection with a Good is limited to an amount equal to the price paid to us by the person to whom we sold the Good.		prohibited by law; (d) where we supply any goods or services other than of a kind ordinarily acquired for personal, domestic or household use or consumption and do so in breach of a condition, warranty or guarantee implied by or arising under any law, our liability for that breach is limited at our option to: (1) in the case of goods: replacement of the goods or supply of equivalent goods; repair of the goods; payment of the cost of replacing the goods or of acquiring equivalent goods; or payment of the cost of having the goods repaired; (2) in the case of services: supply of the services again; or payment of the cost of having the services supplied again.	
Tesla Motors Netherlands	13.5kWh Powerwall	9 February 2017 <sup>121</sup>	Lithium-Ion (NMC)	13.5kWh/13.2kWh	100%	Operating: -20°C to 50°C	10 years from the	Defects warranty: The Powerwall will be	This Warranty applies to any Tesla Powerwall that	This Warranty does not apply	If your Powerwall, fails to comply with the Warranty,	Warranty claims can be made by or on behalf of the end user who	Yes – To the greatest	This Warranty and any	Yes	Yes –

<sup>121</sup> Tesla Motors Netherlands B.V., *Tesla Powerwall Warranty (Australia and New Zealand)* (9 February 2017) [https://www.tesla.com/sites/default/files/pdfs/powerwall/Powerwall\\_2\\_AC\\_Warranty\\_AUS-NZ\\_1-0.pdf](https://www.tesla.com/sites/default/files/pdfs/powerwall/Powerwall_2_AC_Warranty_AUS-NZ_1-0.pdf), Tesla Motors Netherlands B.V., *Powerwall 2AC* (9 February 2017) Solar Quotes, [https://docs.google.com/viewerng/viewer?url=http://www.solarquotes.com.au/blog/wp-content/uploads/2016/11/Powerwall-2-AC\\_Datasheet\\_English.pdf&hl=en\\_US](https://docs.google.com/viewerng/viewer?url=http://www.solarquotes.com.au/blog/wp-content/uploads/2016/11/Powerwall-2-AC_Datasheet_English.pdf&hl=en_US)

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B.V.	II 2 AC					Ambient: -30°C to 60°C  Humidity: Up to 100% condensing	date of installation	free from defects for ten years following its initial installation date.  Performance warranty: The Powerwall will have an energy capacity of 13.5kWh on its initial installation date, and will retain energy capacity as shown below:  Solar self-consumption/ backup only:  Energy retention: 70% at 10 years following initial installation date over unlimited cycles  Any other application or combination of applications:  70% at 10 years following initial installation date over a 37Mwh of aggregate throughput.	(1) was purchased from Tesla or a Tesla certified installer in Australia or New Zealand; (2) has one of the part numbers referenced above; and (3) is installed in Australia or New Zealand.	to any defect or energy capacity shortfall resulting from any of the following, each of which may result in your Warranty being voided: (i) abuse, misuse or negligence, (ii) accidents or force majeure events, including but not limited to lightning, flood, earthquake, fire, or other events outside the reasonable control of Tesla; (iii) storage, installation, commissioning, modification or repair of your Powerwall, or opening of the external casing of your Powerwall, that is performed by anyone other than the installer; (iv) failure to operate or maintain your Powerwall in accordance with the Owner's Manual; (v) any attempt to modify your Powerwall, whether by physical means, programming or otherwise, without the express written consent of Tesla; or (vi) removal and reinstallation of your Powerwall at a location other than the original installation location, without	Tesla will, in its sole discretion, either repair your Powerwall, replace your Powerwall with an equivalent product, or refund you the market price of an equivalent product at the time of the warranty claim. A Powerwall presented for repair may be replaced by a refurbished Powerwall of the same type rather than being repaired. Refurbished parts may be used to repair your Powerwall. If your Powerwall is repaired or replaced under this Warranty, the remainder of the original warranty period will apply to the repaired or replacement product, subject to any rights and remedies you have under local laws in your country or region in respect of the repaired or replacement product.	acquired and put the Powerwall into use for the first time. A subsequent owner of the Powerwall who provides proof of ownership is also entitled to make Warranty claims.	extent permitted by law, this warranty is the only express warranty made in connection with your Powerwall. Any other warranties, remedies and conditions, whether oral, written, statutory, express or implied (including hidden defects) are expressly disclaimed. If such warranties cannot be disclaimed, to the extent permitted by law, Tesla limits the duration of and remedies for such warranties to the durations and remedies described in this Warranty.  Some countries do not allow disclaimers of implied warranties or limitation on how long an implied warranty lasts, meaning the above disclaimers and limitations may not apply to you.  Limitation of liability to the greatest extent permitted by law, Tesla should not be liable for any consequential, incidental,	dispute or claim arising out of or in connection with it (including non-contractual disputes or claims) is governed by and construed in accordance with the laws of the country or (if applicable) state or province where your Powerwall was first installed. If any provision of this Warranty is held by a court of competent jurisdiction to be unenforceable because it is invalid or in conflict with any law of any relevant jurisdiction, the validity of the remaining provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the unenforceable provisions were replaced by valid, legal and unenforceable provision. The United Nations Conventions on Contracts for the International		Safety: UL 1642, UL 1741, UL 1973, UL 9540, UN 38.3, IEC 62109-1, IEC 62619, CSA C22.2.107.1  Grid Standards: Worldwide Compatibility  Emissions: FCC Part 15 Class B, ICES 003, EN 61000 Class B  Environmental: RoHS Directive 2011/65/EU, WEEE Directive 2012/19/EU, 2006/66/EC  Seismic: AC156, IEEE 693-2005 (high)

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										<p>the express written consent of Tesla.</p> <p>in addition, this Warranty does not cover (a) normal wear and tear or deterioration, or superficial defects, dents or marks they do not impact the performance of your Powerwall; (b) noise or vibration that is not excessive or uncharacteristic and does not impact your Powerwall's performance; (c) damage or deterioration that occurs after the expiration or morning of the warranty period; or (d) theft of your Powerwall or any of its components.</p> <p>Exclusion for failure to connect to the Internet or failure to register in order to provide this Warranty for the full 10 year warranty period, Tesla requires the ability to update your Powerwall through remote firmware upgrades. Installation of these remote upgrades may disrupt the operation of your Powerwall for a short period. By installing your Powerwall and connect it to the Internet, you consent to the updating your Powerwall through these</p>			<p>indirect, special, exemplary or punitive damages arising out of or related to this warranty, regardless of the form of action regardless of whether Tesla has been informed of, or otherwise might have anticipated, the possibility of such damages. To the greatest extent permitted by law, tellers liability arising out of a claim under this warranty shall not exceed the amount you paid for your Powerwall. Some countries and regions do not allow, or restrict, the exclusion or limitation of damages, including incidental or consequential damages, so the above limitation or exclusion may not apply to you or may only apply to a limited extent.</p> <p>Australia specific disclosure: This warranty is provided in addition to, and does not exclude, restrict or limit any rights a customer has under the Australian Consumer Law.</p> <p>Your</p>	Sale of Goods (1980) shall not apply to this Warranty or any aspect of any dispute relating to this Warranty.		

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										<p>remote upgrades from time to time, without further notice to you. If your Powerwall is not connected to the Internet for an extended period, or has not been registered with test light, we may not be able to provide and promote firmware upgrades. In these circumstances, we may not be able to honour the full 10 year warranty. We would prefer to avoid this, so will try to notify you if your Powerwall's Internet connection is disrupted for an extended period. It is difficult for us to contact you if you have not registered your Powerwall with us, so please register your Powerwall with Tesla. Even if we can't honour the full 10 year warranty for the above reasons, we will always honour the warranty for at least four years following the date your Powerwall was installed for the first time.</p> <p>Modifications and waivers No person or entity, including a Tesla employee authorised representative, can modify or waive any part of this Warranty.</p> <p>Limitation on use Your Powerwall</p>			Powerwall comes with guarantees it cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund frame major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have your power will repaired or replaced if it fails to be of acceptable quality and the failure does not amount to a major failure. These consumer guaranteed rights apply for a "reasonable period", which depends upon all the relevant circumstances including the price the product, uses to which this been put and the nature of the product.			



Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
						operating temperature of: -10°C~50°C  and an ambient temperature of: -25°C~60°C	within, when installed and used in a manner described within this document. All other system components carry a 5 year Limited Warranty. Limited Warranties shall commence on the date the customer is invoiced for the product.	quantified by the statements below.  Battery Performance and Capacity is warranted as follows: • Battery capacity is warranted to be at least 60% of name-plate capacity after 10 years, or after a total energy throughput of 2339kWhr per kWh of name plate capacity, whichever occurs first. These figures are quantified in absolute terms for each model of PowerCube 2.0 and set out in the Table 1 at the end of this document. Other Inclusions In addition to the warranted Battery Performance and Capacity detailed above, TrinaBEST also warrants that the PowerCube 2.0 shall be free from defects in design, material and workmanship, while warranting that the product conforms to the applicable specifications for a period of 5 years.	Management System • Being installed as per the TrinaBEST Installation and Maintenance manual current at the time of purchase.	provided by TrinaBEST, improper installation, operation in ambient temperature ranges exceeding 0°C and 40°C, or installation in corrosive environment. The warranty shall not apply to defects caused by external influences including unusual physical or electrical stress (power failure surges, lightning, flood, fire, accidental breakage), which are not the responsibility of TrinaBEST. TrinaBEST shall not be responsible or liable in any way to the Buyer for any non-performance or delay in performance under this Limited Warranty due to occurrences of force majeure such as, war, riots, strikes, unavailability of suitable and sufficient labour, material, or capacity, or technical, or yield failures and any unforeseen event beyond its control, including, without limitation, any technological or physical event or condition which could not reasonably be known or understood at the time of the sale of the Product(s), or the notification	the original PowerCube 2.0 Limited Warranty date.		other warranties and/or guarantees, express or implied, are excluded from this transaction and shall not apply for the subject of the warranty. In no event, shall TrinaBEST be liable for any special, incidental or consequential damages of any nature whatsoever for any reason (including, without limitation, lost profits, loss of use, loss of equipment or loss of revenues) regardless of the legal theory on which any such claim may be made, even if advised of the possibility of such damages.			

Company	Product	Warranty date	Battery chemistry	Battery size (Total/usable capacity)	Depth of discharge	Operating temp. /ambient temp./ humidity range	Length of warranty	Warranty coverage	Warranty conditions	Warranty exclusions	Remedies available under warranty (repair, refund, replacement?)	Warranty transfer permitted to subsequent purchasers	Limitations on the application of the ACL, common law or statutory rights and damages	Governing law	Explicitly refers to the existence of statutory rights under the ACL and uses mandatory language	Complies with international standards
										of the claim under this Limited Warranty.						