

Restriction of Publication Part Claimed**STATEMENT IN SUPPORT OF APPLICATION FOR MERGER AUTHORISATION****ORIGIN ENERGY LIMITED**

Target Company

Statement of **Anthony Robert Lucas**

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Occupation Executive General Manager, Future Energy and Technology

Date 2/June/2023

This document contains confidential information which is indicated as follows: [REDACTED]

This document is to be treated as wholly confidential.

The lodgement of this document will be followed by the lodgement of a public version.

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¹ This document includes redactions that give effect to the information protocol in place between Origin's Energy Markets business and its Integrated Gas business, which is the upstream provider for APLNG. The information protocol restricts certain information from relevant people in the Energy Markets business, including myself. The versions of the documents exhibited to this statement are the ones to which I have access and therefore include redactions.

² This document includes redactions for the reasons explained at footnote 1.

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A. BACKGROUND

1. I am the Executive General Manager (EGM), Future Energy and Technology of Origin Energy Limited (Origin). I have held that role since December 2016. I report to the Chief Executive Officer and Managing Director of Origin, Frank Calabria.
2. This statement has been prepared in support of the application by Brookfield LP and MidOcean Energy Ltd for authorisation of the proposed acquisition of 100% of the issued share capital in Origin by way of scheme of arrangement (the **Proposed Transaction**).
3. Exhibited to me at the time of signing this statement is a bundle of confidential documents marked **ARL-1** (which contains documents in respect of which a claim of confidentiality is made by Origin) and a bundle of non-confidential documents marked **ARL-2**. The documents in these exhibits are true and correct copies of the documents referred to in this statement. I have reviewed those documents prior to signing this statement.
4. The matters set out in this statement are true to the best of my knowledge and belief and are based on my knowledge of Origin's operations, my review of Origin's business records, my involvement with Origin's business in my current role, my previous experience (detailed below) and my review of publicly available information.
5. In this statement, I address the following topics:
 - (a) First, my roles and responsibilities at Origin, and my roles prior to joining Origin (the remainder of this **Section A**);
 - (b) Second, an overview of Origin's operations (**Section B**);
 - (c) Third, the background and goals of Origin's Climate Transition Action Plan (**CTAP**) and the challenges associated with this plan and faced in making the energy transition the subject of the CTAP (**Section C**);
 - (d) Fourth, how an acquisition of Origin by Brockfield Asset Management Inc. together with its affiliates and their managed funds (**Brookfield**) would impact Origin's energy transition plans (**Section D**); and
 - (e) Finally, Origin's approach to managing risk in its energy portfolio by hedging, and the effect of an acquisition by Brookfield in light of this (**Section E**).
6. I joined Origin as Risk Analysis Manager in 2002. Since joining Origin I have held the following positions:
 - (a) Between 2002 and 2005, I was a Risk Analysis Manager. I was responsible for developing Origin's Energy Markets business' risk methodologies and models; developing the Energy Markets business' forecasting models; and undertaking portfolio analysis. I explain the nature of Origin's Energy Markets business further at paragraph 14 below.
 - (b) Between 2005 and 2008, I held the position of Manager, Trading and Risk Analysis. In this role I managed portfolio and market analysis; I was responsible for hedging and trading of the Origin Electricity Portfolio; and I was involved in deal negotiation for both short and long term contractual arrangements including Origin's contract with ██████████. In 2008 the name of this role changed to Group Manager, Trading & Risk Analysis. I remained in this role until 2010.
 - (c) Between 2011 and 2016, I held the position of General Manager, Energy Risk Management. In this role I was responsible for portfolio development, transactions and investments, regulatory policy, energy risk management, regulatory

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submissions and advocacy, commercial and finance and business services, settlements and back office.

7. In my current role, I lead the team responsible for Future Energy, Strategy and Technology. In this role I am responsible for Origin's future energy technology and business models. This includes responsibility for:
 - (a) the development of Origin's Energy Markets strategy;
 - (b) the long term financial forecast and valuation model for Origin's Energy Markets business which includes the valuation of Origin's wholesale portfolio, and retail and market risk positions;
 - (c) data and analytics; and
 - (d) managing the implications of regulation on this business.
8. I have eleven direct reports.
9. The Future Energy, Strategy and Technology team is tasked with ensuring that Origin is well-positioned to lead the transition into a low-carbon, technology-enabled world. By this I am referring to the multi-decade changes to the way in which energy is produced and consumed globally. This transformation is driven by the need for decarbonisation, and the trends of decentralisation, electrification and digitisation. My and my team's role involves developing Origin's strategy for its Energy Markets business. This includes setting the strategy for:
 - (a) transitioning out of Eraring power station which is a coal fired power station;
 - (b) the levels of renewable energy, energy storage and firming support the portfolio requires (which include Origin's owned thermal gas peaking power stations);
 - (c) how Origin competes in distributed and digitised energy markets for both business and residential customers.
10. One of my key work products as EGM of Future Energy and Technology has been to produce Origin's CTAP which was published in August 2022. I was involved in the overall design, structure and strategy of Origin's CTAP, and I am responsible for the targets set out in it. I was an active member of the due diligence committee (DDC) established to oversee the drafting and verification of the CTAP. The CTAP is further described in Section C below.
11. Before joining Origin, I worked at Integral Energy from 2000 until 2002, where I held a market risk manager role.
12. I began my career in the banking industry before moving into the energy sector. Before joining Integral Energy I held the following roles at the following companies:
 - (a) Bank of New Zealand from December 1990 to August 1994, where I had a commercial lending analysis role;
 - (b) Standard Chartered Bank London from October 1994 to June 1995, where I was responsible for market risk interest rate derivatives;
 - (c) UBS London from August 1995 to November 1995, where I was responsible for interest rate derivatives profit and loss reporting;
 - (d) Lehman Brothers London from November 1995 to August 1996, where I was responsible for base metals profit and loss reporting and market risk; and

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- (e) Bankers Trust Australia from August 1997 to December 1999, where I was responsible for interest rate derivatives profit and loss reporting.

B. OVERVIEW OF ORIGIN'S OPERATIONS

13. Origin is an Australian Securities Exchange (ASX) listed integrated energy company with activities in energy retailing, power generation, natural gas production and liquefied natural gas (LNG) export. Origin has two business units: the Energy Markets business and the Integrated Gas business.
14. The Energy Markets business operates through the following lines of business in Australia:
- (a) **Energy Supply and Operations**, which comprises:
- (i) a 7,835 MW generation portfolio comprising 6,080 MW of own generation and 1,515 MW of contracted renewables and 240 MW from other contracts, as at the half year ended 31 December 2022. Origin's generation portfolio is described in more detail on p.20 of Origin's 2023 Half Year Report, a copy of which is exhibited to this statement at Tab 1 of Non-confidential Exhibit ARL-2;
 - (ii) a contracted fuel position that supports the generation portfolio to service retail demand;
 - (iii) the procurement and distribution of liquefied petroleum gas (LPG) and propane to residential and business locations;
 - (iv) the procurement and distribution of gas to residential and business locations;
- (b) **Retail (Residential and Business)**, which comprises:
- (i) the sale of electricity, gas and LPG to residential, small to medium enterprise (SME), and commercial and industrial (C&I) customers across Australia;
 - (ii) Solar and Energy Services, which comprises the installation and maintenance of solar photovoltaic (PV) systems and batteries for residential and business customers and the Community Energy Services (CES) business. The CES business provides serviced hot water, natural gas and electricity via embedded networks and other related services, such as communal solar and battery systems, to apartment blocks;
 - (iii) the provision of broadband services to retail customers;
- (c) **Future Energy and Business Development**, which is responsible for trialling new technologies and investing and deploying new energy solutions to deliver smarter and cleaner energy. The current focus of the Future Energy and Business Development business' activities is the expansion of the Origin Loop in-house Virtual Power Plant (VPP)³ and the deployment of digital products and services that reflect the continued shift towards a distributed and data-driven energy landscape;
- (d) **Origin Zero**, which partners with large businesses to achieve their sustainable energy goals through a range of energy and energy management services (further explained at paragraph 37 below).

³ Explained further at paragraphs 34 and 58–63 below. See also www.originenergy.com.au/solar/panels-batteries/virtual-power-plant/.

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15. Origin has a 20% interest in United Kingdom (UK) energy retailer Octopus Energy Ltd (**Octopus Energy**). Octopus Energy is a UK-based energy group which focuses on sustainable energy. In May 2020 Origin established a strategic partnership with Octopus Energy through acquiring a 20% equity interest in Octopus Energy as well as a licence in Australia to Octopus Energy's market leading customer platform technology, known as Kraken. The purpose of the investment was to transform Origin's retail operations by delivering an improvement in customer experience, a material reduction in costs and opening future growth opportunities.⁴
16. Origin's Integrated Gas business is an asset led organisation that consists of a 27.5% interest in Australian Pacific LNG Pty Limited (**APLNG**); exploration interests (including in the Cooper Eromanga and Canning basins) which, following Origin's September 2022 announcement, are under strategic review with a view to exiting those permits over time; and Origin's Future Fuels business which includes its exploration of hydrogen development opportunities. Origin provided an update on progress in exiting its exploration interests on p.30 of its 2023 Half Year Report, a copy of which is exhibited to this statement at **Tab 1 of Non-confidential Exhibit ARL-2**. APLNG is an incorporated joint venture in which ConocoPhillips holds 47.5%, Origin holds 27.5% and China Petrochemical Corporation (also known as Sinopec) holds 25%. APLNG owns an LNG facility located on the southwest side of Curtis Island. Origin is the operator of the upstream coal seam gas (**CSG**) exploration and responsible for appraisal, development and production activities associated with this facility. Origin is also the CSG marketing agent for APLNG and its corporate service provider. Origin's Future Fuels business is pursuing opportunities in hydrogen produced by renewable powered processes. These projects are described further at paragraph 35 below.

C. ORIGIN'S CTAP, ITS TARGETS, AND THE CHALLENGES IT FACES FOR THE ENERGY TRANSITION

Background to the CTAP and Origin's renewables targets

17. Origin published its first CTAP in August 2022. A copy is exhibited to this statement at **Tab 2 of Non-confidential Exhibit ARL-2**.
18. The CTAP is a document to show investors what Origin is doing with respect to emissions reduction across the company. In addition to outlining its strategy for the future, the CTAP documents a decarbonisation strategy which Origin has been implementing since at least 2015. Part of that strategy included in 2015 becoming the first energy company in the world to commit to the We Mean Business Coalition's first seven commitments.⁵ This commitment included the goal of achieving an independently endorsed science-based emissions reduction target. Since 2015, Origin has taken a number of further significant actions to achieve its decarbonisation goals. A chronology of those steps is described at p.9 of the CTAP.
19. The CTAP outlines Origin's strategy and ambition to lead the energy transition and details updated targets for emissions reductions across the Origin business over a three year period. Earlier in 2022, prior to the publication of the CTAP, Origin articulated a renewed strategy to drive decarbonisation and evolve Origin's portfolio supported by three strategic pillars: (1) unrivalled customer solutions; (2) accelerate renewable and cleaner energy; and

⁴ See <https://www.originenergy.com.au/about/investors-media/strategic-partnership-with-octopus-energy-to-transform-origins-retail-business/>.

⁵ The We Mean Business Coalition is a global non-profit coalition of other business-focused climate nonprofit organisations, working with influential businesses to take action on climate change. See www.wemeanbusinesscoalition.org/about/.

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(3) deliver reliable energy through the transition. To do this, Origin decided to focus on three decarbonisation priorities (explained further at paragraphs 26 – 41 below):

- (a) to reduce emissions from Origin's existing operations;
- (b) to grow Origin's portfolio of renewables and cleaner energy; and
- (c) to enable customers to decarbonise.

20. Origin's longer term ambition is to reach net zero in respect of what are commonly referred to as "Scope 1, 2 and 3"⁶ emissions by 2050. Scope 1 emissions are greenhouse gas (GHG) emissions released to the atmosphere as a direct result of Origin's activities, including emissions from electricity generation and gas production (these are also referred to as "direct emissions"). Scope 2 emissions are GHG emissions resulting from purchased electricity used to power Origin offices and operating sites. Scope 3 emissions are indirect GHG emissions, other than Scope 2, relating to Origin's value chain, including wholesale purchases of electricity from the National Electricity Market (NEM) and the use of sold goods, such as Origin's equity share of LNG export volumes from its interest in APLNG and domestic gas sales.
21. The CTAP contains new short and medium term targets for increased emissions reduction. Origin's new short and medium term targets are to achieve, by 2030, a 40% reduction in Scope 1, 2 and 3 equity emissions⁷ intensity and 20 million tonnes reduction in Scope 1, 2 and 3 equity emissions (against a FY2019 baseline).
22. Pages 14 to 21 of the CTAP detail Origin's strategy to meet the above targets and its ambition of reaching net zero Scope 1, 2 and 3 emissions across its value chain by 2050.
23. Under the CTAP, Origin aims to grow renewables and storage capacity within the generation portfolio to 4 GW by 2030. Achieving 4 GW of renewable generation by 2030 would require obtaining additional renewables and storage of 2,332 MW.⁸
24. The CTAP reflects the minimum level of commitments that Origin will achieve in its energy transition to renewables. Origin's confidential long term financial plan (LTFP) incorporates [REDACTED] exhibited to this statement at **Tab 1 of Confidential Exhibit ARL-1**.⁹ The LTFP reflects [REDACTED] exhibited to this statement at **Tab 2 of Confidential Exhibit ARL-1**.

⁶ These terms were used in the 2001 Greenhouse Gas Protocol and have been adopted widely since.

⁷ The term "equity emissions" in this context means proportional emissions from Origin's equity investments (e.g. Origin's equity interest share of APLNG) (see definition on p.35 of the CTAP).

⁸ Origin currently has 1,515 MW of renewable generation and 240 MW storage capacity, however 87 MW of this renewable generation capacity will expire (due to the expiration of PPAs) before 2030. Accordingly, to achieve the CTAP commitment of 4 GW by 2030 would require an additional 2,332 MW (= 4,000 MW (CTAP commitment) – 1,515 MW (current renewable generation) + 87 MW (expiring generation) – 240 MW (storage)).

⁹ This document includes redactions for the reasons explained at footnote 1. Section 2 begins at p.27 of **Tab 1 of Confidential Exhibit ARL-1**.

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Decarbonisation priority – Reducing emissions from Origin's existing operations

25. As noted at paragraph 19(a) above, the first of Origin's decarbonisation priorities is to reduce emissions from Origin's existing operations. I outline the steps which have been taken and are being undertaken in pursuit of this priority immediately below.

Eraring power station

26. On 17 February 2022 Origin announced to the ASX that it had submitted notice to the Australian Energy Market Operator (AEMO) indicating the potential early retirement of the Eraring coal-fired power station, potentially as early as August 2025, at the end of the required 3½ year notice period (having previously targeted closure by the end of the asset's technical life in 2032). A copy of this announcement is at **Tab 3 of Non-confidential Exhibit ARL-2**. A further announcement to the ASX on 20 April 2023 noted that "Origin will continue to assess the market over time, and this will help inform the final timing for closure of all four units at Eraring. Origin will also continue to actively engage with the market operator, NSW Government, our people and the local community regarding plans for Eraring's closure". A copy of this announcement is at **Tab 4 of Non-confidential Exhibit ARL-2**.

Reduced emissions from Origin's gas operations

27. Gas will continue to be a key part of Australia's and the world's energy mix. Origin will continue to run a gas business that is reliable and competitive, but which is also focused on decarbonisation.
28. It is expected that APLNG's operations will grow in the coming year, however, despite this, Origin will continue to target a reduction in operational control methane emissions over the next three years. As upstream operator for the APLNG project, Origin will concentrate on reducing Scope 1 and Scope 2 operational emissions associated with upstream producing and operating assets, noting that some decarbonisation initiatives will require support from the incorporated APLNG venture. Managing Scope 3 emissions from Origin's equity share in APLNG will be more challenging and will require Origin to work with its customers to better understand their decarbonisation goals and identify opportunities to manage Scope 3 emissions. As Origin is only one of three participants in the JV, the undertaking of such work requires the support of other participants for this to be achieved.

Decarbonisation priority – Growing Origin's portfolio of renewables and cleaner energy

29. Origin's approach to growing its portfolio of renewables and cleaner energy is to invest further in renewables, purchase more from a decarbonising electricity grid, and invest in storage.
30. The focus of these opportunities is on large-scale solar, wind and batteries. This may involve Origin-owned installations or contracted sites, utilising a combination of direct investments and accessing third-party capital.
31. Origin is a net buyer of electricity from the market, which means it generates less electricity from Origin assets than it sells to its customers. Origin plans to increase the share of renewables supply in its portfolio to meet the demands of its large customer base, which will assist in reducing the emissions intensity of the portfolio.
32. Origin takes a portfolio approach to developing the level of renewable generation and storage capacity required to reach the targets in the CTAP [REDACTED] This

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means that we explore a combination of different opportunities of different types (including potential sites for projects, development opportunities on those sites, and the mix of direct investment in specific projects and power purchase agreements (PPAs)). This is because the prospects and timing of successfully developing a project to completion can be impacted by many variables, of which some are outside Origin's direct control (see, further, paragraphs 40(c), 48, and 81 below). The particular mix of PPAs and direct investment is not set, and will be driven by factors such as the quality of Origin-owned sites, the time required to develop Origin-owned sites, capital available, the pricing of PPA offers, and the timing of when PPA volumes may be available.

33. In pursuit of its priority of growing its portfolio of renewables, Origin has purchased both early and late stage solar development sites, all of which are currently pre Final Investment Decision (FID). Origin also has a number of brownfield storage sites (i.e. sites which Origin already owns and which could accommodate renewable energy storage) which, with the exception of the Eraring power station site, are yet to receive planning approval. The final size and timing of these projects (should they proceed) will depend on development costs and the timing of transmission and planning approvals. In addition, the alternative PPAs that might be offered in the market at the time will influence precisely what contribution each project makes to the CTAP [REDACTED] targets. The following renewables and storage opportunities are amongst those currently under consideration:¹⁰

Battery storage opportunities (on brownfield storage sites)

- (a) **Eraring Battery, NSW** – The proposed battery project (which is currently proposed to be carried out in stages) has a potential peak output of 700 MW for up to 4 hours (or lesser loads for longer periods). Planning approval for all stages was secured from the NSW Government in May 2022. Origin has worked to finalise design and contracting for the first stage of the project (460 MW / 2 hour battery) and this has now reached a FID. Following the FID in March 2023, the Origin team finalised the supply contract and the design and construct contract, which were signed on 20 April 2023, and the project was announced to the market on that date. [REDACTED]
- (b) **Mortlake Battery, Vic** – Origin is proposing to develop a large-scale battery storage project adjacent to Origin's gas-fired Mortlake Power Station. The battery will be connected into the 500kV network to which the existing gas turbine units are connected. Origin is currently preparing the required studies and intends to seek planning approval from the Victorian State Government. [REDACTED]
- (c) **Darling Downs Battery, Qld** – Origin is proposing to construct a 500 MW battery with a storage capacity of up to 2000 megawatt hours. The battery will be installed beside Origin's Darling Downs Power Station, a combined cycle gas fired power station, with an existing generation capacity of 630 MW. The battery will be charged via the existing grid connection and dispatched at times of high demand. This project has secured approval from the Western Downs Regional Council. Origin will undertake competitive sourcing processes to identify suitably qualified equipment supply and installation contractors for the battery.

¹⁰ See generally <https://www.originenergy.com.au/about/who-we-are/what-we-do/development-projects/>.

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Solar opportunities (on new development sites)

- (d) **Carisbrook Solar Farm, Victoria** – This well-advanced solar development project has an export capacity of 74 MW of solar generation. Output from the solar farm will connect into the national electricity grid. [REDACTED]
- (e) **Yanco Solar Farm, NSW** – This renewable generation project has an export capacity of 60 MW (AC) of solar generation. The project will connect to the national electricity grid through Transgrid's Yanco substation located southeast of the project site. The planning permit also allows for development of a battery energy storage facility or system (with a maximum capacity of 81 MW). The project secured planning approval from the NSW Government in July 2020. [REDACTED]
- (f) **Yarrabee Solar Farm, NSW** – Planning approval was secured from the NSW Government in December 2018 for 900 MW of solar generation and a 35 MW battery. The project was initially intended to be built in two 450 MW generation stages. [REDACTED]
- (g) **Morgan Solar Farm, SA** – The project was planned to include a solar farm with a generation capacity of up to 250 – 300 MW, with a battery energy storage system of up to 80 MW. The plan was to develop the project in two stages, with stage one comprising up to 120 MW of solar power. The project secured development approval from the South Australian Government in September 2020. [REDACTED]
- (h) **Dapper Solar Farm, NSW** – Origin is seeking development approval for a 250 – 300 MW solar development project. During 2023, Origin will undertake a range of assessments and studies that will form part of the development application to NSW Government.

Pumped Hydro expansion

- (i) **Shoalhaven Hydro Pump expansion, NSW** – Origin proposes to expand its Shoalhaven pumped hydro storage scheme with the installation of one additional ~235 MW generating unit. The NSW Government approved the Environmental Impact Assessment (EIS) for proposed geotechnical works in November 2019. Origin completed and lodged a full EIS for the project in early November 2022. Higher than anticipated pricing estimates from construction contractors meant Origin did not submit the Shoalhaven expansion for consideration in the Long-Term Energy Service Agreements (LTESAs) funding application process in February 2023. The Shoalhaven expansion project remains an advanced development option and we continue to take steps to secure the necessary environmental and regulatory approvals and will re-test pricing at a later date when economic and market factors may have changed.

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34. Further, Origin's strategy involves growing its VPP and existing gas peaking fleet to ensure it has the ability to manage peak customer demand. The VPP connects distributed energy resources (DER)¹¹ across a number of locations and aggregates and coordinates them to work together, allowing Origin to manage the supply and demand balance in the electricity market in real time. This is explained further at paragraphs 58 – 63 below.
35. Origin's Future Fuels business is pursuing opportunities in hydrogen produced by renewable powered processes. This includes a proposed hydrogen production facility in collaboration with Orica, to be located in the Hunter Valley region of NSW. The proposed facility would produce hydrogen for manufacturing and mobility applications.¹² Origin has also completed a feasibility investigation of an export scale green hydrogen and ammonia project in the Bell Bay industrial precinct in northern Tasmania. Origin is also in a feasibility study for the export of methylcyclohexane (MCH) from Gladstone in Queensland.

Decarbonisation priority – enabling customers to decarbonise

36. Origin's approach to enabling customers to decarbonise is to provide customers with a growing portfolio of affordable and simple low-carbon products and cleaner energy solutions. These include rooftop solar and batteries, renewable and carbon-neutral energy, electric vehicle (EV) solutions, renewables PPAs, and load and demand management.
37. To address the needs of its commercial and industrial customers, Origin has set up Origin Zero. Origin Zero provides tailored energy solutions to commercial and industrial customers. In May 2021 I proposed the strategy and concept for Origin Zero, following which my team had initial discussions with customers to develop and refine the strategy. Thereafter, in November 2021 Origin announced the appointment of James Magill to the newly created role of Executive General Manager Origin Zero. His role was to set up the business structure and run the Origin Zero business going forward.
38. The idea underpinning Origin Zero was to change the products we sold to our commercial and industrial customers so that instead of just selling them gas and electricity, we would sell them structured products to assist in their decarbonisation. The Origin Zero team works with customers to develop a specific portfolio which will help them decarbonise. This can involve a range of different products including DER. Thus, as part of developing and offering those structured products to commercial and industrial customers, Origin itself needed to invest in additional renewable products, that it could package and sell to those customers.
39. In my experience, since the commencement of Origin Zero, some customers, particularly larger commercial and industrial customers, want direct access to renewable projects, rather than Origin, in effect, simply surrendering Large-scale Renewable Energy Target (LRET) certificates¹³ from a mixture of renewable sources. Customers are generally unlikely to be concerned about whether Origin owns the renewable project or has a direct PPA from it, as long as they are able to state that they obtain their renewable energy from a particular named project. This means that, for Origin to be successful in selling access to

¹¹ DER (also referred to as distributed energy assets) are (often) smaller generation units that are located on the consumer's side of the meter. Examples of DER that can be installed include rooftop solar photovoltaic units, wind generating units, battery storage, and batteries in electric vehicles used to export power back to the grid.

¹² See generally <https://www.originenergy.com.au/about/investors-media/origin-planning-newcastle-hydrogen-hub/>.

¹³ The LRET is a Federal Government scheme that aims to incentivise the development of renewable energy power stations in Australia through a Renewable Energy Certificate Market for the creation and sale of certificates called large-scale generation certificates. See, further, www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/How-the-scheme-works/Large-scale-Renewable-Energy-Target.

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renewable projects to customers through Origin Zero, it needs to invest in renewables, either through investing directly or underwriting projects with a PPA.

40. While customers are generally agnostic as to whether Origin invests directly or has a PPA, from Origin's point of view there are downsides to the latter notwithstanding that PPAs are off balance sheet and do not involve the level of upfront capital as direct investment. For example:
- (a) From the perspective of the Origin Zero business, it can generally have a greater level of confidence in offering volumes from its own projects to customers rather than offering volumes from projects where Origin holds a PPA. This is because PPAs are usually conditional on the project reaching financial close, and Origin does not receive full volumes until the project reaches commercial operation, and both of these are outside of Origin's control. By contrast, Origin has access to construction management and capital in respect of its own projects, which provides a higher level of certainty.
 - (b) From a corporate perspective, there is a limit to how many PPAs Origin can enter (a so-called 'capital-light' approach), because, as more PPAs are used, the ongoing operating cash costs to the business increase (compared to what would be the case for owned renewable projects), leading to increased operating leverage, and at some point this would affect the balance sheet structure and credit rating of the business.
 - (c) From a renewable development perspective, combining Origin's customer position with construction management and capital creates a position that has all the elements required to successfully develop renewables. Generally, there are three key elements required at the outset of a prospective new renewables project: (i) a PPA; (ii) finance; and (iii) analysis of the site's economics (informed by engineering, procurement and contracting (EPC) work). Each of these elements need to be progressed in parallel by a developer of a prospective project because they are all interdependent and involve different parties with varying priorities and attitudes to risk: a PPA is driven by the economics of the site; the terms of the PPA combined with the site's economics will affect the financing and the level of leverage involved; and progressing the EPC work and risk management analysis needed to assess the economics of the site. In my experience, the reason why some prospective projects fail at a relatively early stage is because it has not been possible to progress these three elements together. By contrast, if a PPA is not involved and instead the prospective project is financed directly (on balance sheet), the interdependency of a PPA and financing does not need to be considered, and the focus can be on progressing the EPC work and risk management analysis. This means that the initial stages of a project can proceed much more rapidly, and it also means there is a lower prospect of the project failing at an early stage due to an inability to secure sufficient certainty on a PPA and financing from multiple parties at the same time.¹⁴
41. An example of Origin's attempts to invest directly in renewables was its participation, in December 2022, in a consortium with Caisse de dépôt et placement du Québec (CDPQ), in

¹⁴ For completeness, even in this latter case where the initial investment is on balance sheet, once a project is up and running and de-risked, the project may then be sold and a PPA entered into to secure ongoing offtake. But this is primarily a financing decision at this point (compared with seeking to finance a project using a PPA at the outset, which leads to the timing and certainty risks I have explained).

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the sale process for CWP Renewables.¹⁵ The purpose of participating in this process was to gain access to renewable sites and a development team to develop the sites which Origin could then offer to its commercial and industrial customers. While Origin may or may not have invested its capital in these sites, if successful in the sale process, it would have had access to the output from the sites that it could package and then sell to its customers. (Ultimately, [REDACTED] and CWP Renewables was sold to Squadron Energy.)

Scenario testing

42. The CTAP and [REDACTED] assume a "base case" scenario which would meet Origin's short and medium term targets of 4 GW by 2030 with a 40% reduction in Scope 1, 2 and 3 equity emissions¹⁶ intensity by 2030 from a FY2019 baseline.
43. However, given the uncertainty of the shape and speed of the energy transition, Origin needs to ensure that there is flexibility within the portfolio to enable Origin to meet these targets and, at the same time, balance important considerations of reliability, security and cost. Origin, accordingly, undertakes scenario testing, primarily to understand where it has levers elsewhere in the portfolio to meet its CTAP commitments and [REDACTED]. We have therefore tested a number of other scenarios that differ from the base case plan, to ensure that they also meet our short and medium term targets.
44. The testing occurs at two levels:
- (a) First, we examine the range of things we could do within our business to meet CTAP [REDACTED] targets. Examples of this testing are:
 - (i) proposing keeping the Eraring power station operating for slightly longer; or
 - (ii) deciding to invest in additional gas peaking plants or an expansion of an existing plant.
 - (b) Secondly, we test scenarios which are outside of our control, which involves testing a considerable number of market scenarios. An example of this is, if the commercial and industrial customer segment market does not decarbonise as expected, could Origin invest more heavily in renewables, either through PPAs or on balance sheet so that Origin can still meet its targets.
45. This scenario testing is presented by me and/or my team to the Executive Leadership Team (ELT) and then some aspects of it may be presented to the Board or a Board Committee. An example of such scenario testing is shown at **Tab 3 of Confidential Exhibit ARL-1**.¹⁷ [REDACTED]

¹⁵ CWP Renewables is a renewable energy company that focuses on wind, solar and battery farms, with more than 1.1 GW in wind assets currently in operation. Its asset portfolio includes the Sapphire Wind Farm in New South Wales, which features 75 turbines and has the capacity to generate up to 270 MW of clean energy; the Murra Warra I and II projects, whose total capacity amounts to 435 MW, and Crudine Ridge, a wind farm that can generate 142 MW of clean energy. CWP Renewables' customers include Transurban, Woolworths Group, Sydney Airport and Commonwealth Bank of Australia.

¹⁶ See footnote 7 above.

¹⁷ This document includes redactions for the reasons explained at footnote 1.

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Challenges Origin faces in delivering its transition plan

46. In seeking to deliver its transition plan Origin faces a number of challenges. These include challenges arising from the volatility in renewable energy production and factors that give rise to volatility in pricing. These challenges have an impact on the speed, scale and manner in which Origin can execute its energy transition plans. These challenges are driven by changes in the energy market which I explain below.

The need for capital investment

47. Renewable and cleaner energy solutions such as solar, wind and batteries are typically produced by large infrastructure assets with high upfront capital investment and low ongoing operating costs. This is to be contrasted with the high operating costs of thermal generation assets that have typically been relied upon for energy generation in the market. To achieve the shift to renewable and cleaner energy solutions at scale requires access to large volumes of capital for investing in large infrastructure assets. This becomes critical for scale investment.
48. As explained at paragraph 40 above, for new projects, direct investment is preferable, as there is a limit to the scale of projects that can be underwritten with PPAs; and direct investment (as compared with underwriting projects using PPAs or otherwise obtaining third party financing) also decreases the complexity of projects and reduces uncertainty. Any reduction in uncertainty is helpful, as there are many points at which a project may fail prior to the commencement of construction. Direct investment allows a more agile approach to undertaking the initial stages of a potential project (as explained at paragraph 40 above); and this may mean, for example, that more potential projects could be investigated and progressed at early stages such that the impact of the failure of one project (for reasons of regulatory approval or otherwise) is reduced. Additionally, direct investment in and of itself may be a factor that makes the approvals process easier. For example, obtaining the assignment of access rights in the Renewables Zones in NSW is subject to fulfilling merit criteria, one of which is "a strong pathway to commercial operation" which is easier to demonstrate where the proponent is directing investment to supply its own customers.

Relying on firming assets

49. The introduction of variable renewable energy sources (i.e. intermittent energy sources such as wind and solar) will have an impact on supply patterns in the grid. Generation and storage assets known as "firming assets", such as gas peaking power stations, as well as batteries and hydro, will play a significant role in supporting the growth of renewables by facilitating a smooth transition.
50. Firming assets perform two functions:
- (a) First, they are turned on to provide additional generation in order to meet circumstances of extreme customer demand. This typically occurs on days with high or low temperatures (particularly consecutive days of high or low temperatures). This demand has always existed and has historically been provided by gas peaking plants and hydro powered generation. Peaking generation is also required for circumstances with less extreme customer demand, such as in the mornings or and evenings where demand is typically highest for the day.

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- (b) Second, with the transition to a greater proportion of renewables, there will be a need for firming generation when renewables cannot operate, for example, because there is not enough wind or sun. This will happen on an hourly and daily basis and also on a seasonal basis. For hourly and daily requirements, this need can be met by large scale batteries. For longer requirements (including seasonal), gas peaking power plants will be required.
51. A challenge for Origin in this space will be the development of battery storage. For example, once the Eraring power station is decommissioned (see paragraph 26 above), this will need to be replaced with additional capacity. In that regard, Origin's plans for the Eraring site include the installation of large scale battery capacity. [REDACTED]
[REDACTED] at Tab 1 of Confidential Exhibit ARL-1.¹⁸
52. [REDACTED]
53. In addition, the variability in production arising from renewable energy generation may also be likely to lead to increased price volatility. Currently, operators of thermal generators price the electricity they sell into the wholesale market by reference to the short run marginal costs (SRMC) of operating their thermal generation assets. Unlike thermal generation assets, renewable energy assets typically have low operational costs and no variable costs of production (such as the cost of coal or gas used as fuel) and are known as "zero-SRMC" or "low-SRMC" assets. It is expected that, faced with zero or low marginal costs from such renewable assets, operators of thermal assets will seek to recover their fixed costs through periods of extreme prices when generation is required from their assets, which would lead to increased price volatility. Additionally, some thermal generation facilities have slow ramp rates and take time to both reduce and increase generation output. As renewable generation is variable and sometimes produces large swings in aggregate over short periods of time, the delayed response from thermal generators can lead to both high prices and low prices (and even negative pricing). Such volatility would need to be managed by, for example, deploying the types of hedging strategies outlined in Section E below.

Decentralisation and managing this using a VPP solution

54. Historically both commercial and industrial customers, as well as retail customers, would choose an energy retailer based on price and the provider would then supply electricity. It was a one-way supply arrangement and the product offering was fairly standard across electricity providers.
55. Generation and storage assets are increasingly becoming distributed through the network and are able to be controlled by customers. These will typically be owned by customers and used to meet their own energy requirements. This applies not only to commercial and industrial customers, but also to residential and SME customers (also known as mass market customers).

¹⁸ This document includes redactions for the reasons explained at footnote 1. Page 29 of Tab 1 of Confidential Exhibit ARL-1 is p.3 of Section 2.

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56. With distributed assets (such as solar energy systems), customers are selling electricity as well as buying it. The nature of the products that customers will want may change over time and electricity providers need to be able to respond to these different requirements.
57. In addition, given the extent to which physical devices are now connected to the internet (known as the Internet of Things), this connectivity can be used to help manage demand and supply in the broader energy system.
58. This decentralisation can be managed by deploying a VPP. Origin's VPP offering is known as Origin Loop. As at 31 December 2022, Origin Loop had 449 MW of assets connected (see p.24 of Origin's 2023 Half Year Report, exhibited to this statement at **Tab 1 of Non-confidential Exhibit ARL-2**).
59. The purpose of a VPP is to stabilise energy, reduce pressure on the grid when demand is high, and make energy production, distribution and consumption smarter and more sustainable. A VPP works in two parts:
- (a) It reads many different data sources to forecast demand and supply. This includes drawing on:
- (i) weather forecasts;
 - (ii) usage data;
 - (iii) pre-dispatch pricing in the NEM;
 - (iv) historical demand;
 - (v) customer preferences; and
 - (vi) distribution network operating parameters.
- (b) The VPP then uses an algorithm to coordinate the dispatch of thousands of connected devices including:
- (i) solar;
 - (ii) batteries
 - (iii) air conditioners;
 - (iv) hot water systems;
 - (v) smart plugs;
 - (vi) EV chargers; and
 - (vii) batteries.
60. Being able to manage supply and demand in this way can lead to lower costs overall in the system, with benefits flowing through to customers. For example, if a customer connects an electric vehicle to the network, this device can be enrolled on the Origin Loop VPP and Origin's algorithm will find the lowest cost times to charge the vehicle by looking for times during the day or night where there is excess renewable supply available. This helps balance the energy system overall, as the car is charging when system demand is low and the system has over-supply. This benefits the customer through a lower cost to charge the

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car, and it benefits the system by avoiding the need to augment assets to manage demand at peak times which would be necessary if there were not this balancing mechanism.

61. Without a VPP, a customer load would be more volatile as it is uncoordinated with the system. This could create instances in the distribution network that lead to reliability issues.
62. Building out Origin's VPP and supporting systems that allow Origin to connect thousands, potentially millions, of devices and control how they operate is expensive. Once the system is built, it is comparatively low cost to add additional customers, and incremental additional customers do not contribute significantly to the operating expenditure for the platform.
63. In the future, an energy retailer will need to have a more diversified offering. Customers will not simply wish to buy electrons; they will want to have access to a complete energy solution. For example, a customer may want to utilise residential "flex charging" in relation to their EV, which involves flexibility in when electricity is used for, for example, hot water or when solar or a battery is utilised. To implement this, Origin would need to have a digital platform that would enable the customer's requirements to be managed in line with supply and demand on the grid, where the customer would use an app to indicate their preferences and a digital platform would sense when the car comes onto the energy system, with the system needing to adapt through the night as energy uses change. Origin's investment in Octopus Energy¹⁹ and its Kraken platform utilises a similar thesis whereby a digital platform is needed to bring on these assets and gives the customer a holistic digital experience, rather than simply an energy supply agreement, billing engine, and a call centre as the primary interaction with customers.

Investing in digitisation

64. Retailers are starting to adopt digital-first models to provide a good customer experience for digitally aware consumers and to reduce servicing costs. Origin's plans for this are set out at pp.43 – 46 of Origin Energy's Investor Briefing 2020, a copy of which is at **Tab 5 of Non-confidential Exhibit ARL-2**. The way to achieve a shift from fairly static periodic customer engagements to a more dynamic energy flow, with real time customer interaction and engagement, is through establishing a platform which the customer interacts with on a continuous basis. This enables the management of supply and demand on an individual customer basis whilst maintaining the overall stability of the system.
65. Origin started on this process back in 2017 and has been gradually building it out through:
 - (a) the development and roll out of the Origin App which enables customers to operate their electricity and/or gas accounts through the App. The Origin App is continuing to be developed with the introduction of additional features and increasingly greater ability to manage supply and demand from the App.
 - (b) the development and roll out of Origin Spike, which is a rewards program that seeks to encourage customers to reduce electricity usage during periods of high demand, including through the flexibility of smart connection assets;
 - (c) the development of the VPP structure which I have described in paragraphs 58 – 63 above; and
 - (d) improvements to the customer interface and now with the implementation of the Kraken transformation, based on technology licensed from Octopus Energy. Kraken is a technology platform created specifically for the energy sector, based on advanced data and machine learning capabilities, and built around the

¹⁹ See paragraph 15 above.

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customer. It is designed to drive the smart grid and improve the efficiency and customer service of energy suppliers. It provides billing, payments, meter data management, customer communications, digital self service, and contact centre telephone services.

D. HOW WOULD AN ACQUISITION BY BROOKFIELD IMPACT ORIGIN'S ENERGY TRANSITION PLANS?

66. In March 2022, Origin released its strategy refresh to the market in a document entitled 'Origin Energy – Our strategy', dated 9 March 2022 (**Strategy Document**), a copy of which is at **Tab 6 of Non-confidential Exhibit ARL-2**. My team and I were responsible for formulating the Energy Markets Strategy section of that document, at pp.13 – 29.
67. The matters set out in the Strategy Document reflect Origin's current strategy with respect to energy transition. It sets Origin's ambition as being "to lead the transition to net zero through cleaner energy and customer solutions" which are to be delivered through the following strategic pillars:
- (a) unrivalled customer solutions delivered through:
 - (i) a leading brand providing lowest cost and superior customer experience;
 - (ii) smart, connected and low carbon solutions to enable customers' transition to net zero; and
 - (iii) significant growth in customer scale and breadth of offering;
 - (b) accelerate renewable and cleaner energy through:
 - (i) accelerating growth in renewable energy supported by peaking generation;
 - (ii) investing in storage to support growth of renewable energy;
 - (iii) growing Origin's in-house VPP; and
 - (iv) developing a scalable domestic and export hydrogen business;
 - (c) maximising cash flow and value through:
 - (i) providing the energy customers require today while funding the energy transition;
 - (ii) decarbonising the portfolio consistent with 1.5 C pathway; and
 - (iii) new gas supply to be consistent with our decarbonisation commitments.
68. In my view, and based on my experience at Origin in particular as EGM of Future Energy and Technology, Brookfield ownership of Origin will benefit and accelerate Origin's achievement of the goals set out in the Strategy Document through the strategic pillars identified above. Brookfield ownership will provide greater access to capital, expertise and enhanced risk management. These benefits will give Origin better access to capital, talent and know-how, as well as a greater capacity to invest in renewable assets and to do so more rapidly than Origin could achieve on its own. Whilst Origin could achieve its transition objectives without Brookfield ownership, in my view, it would take longer, be more difficult to overcome the challenges explained above (at paragraphs 46 – 65), and would likely result in a smaller renewables portfolio at a higher cost. I explain the bases for this view further below.

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Unrivalled customer solutions

69. As an ASX listed entity, Origin has a broad shareholder base of institutional and retail investors. Capital management requires balancing the return of capital and/or dividends to shareholders and the ability to reinvest capital in the energy transition. This provides a natural constraint to the amount of growth capital expenditure that Origin can allocate to its renewable energy ambitions. The size and speed of the transition could not be entirely funded from cashflow generated from the business and would ultimately require raising capital through public markets. Public markets have a much shorter return horizon, and tend to focus on how quickly the use of funds provides returns. The returns from renewable investments are much more longer-dated, which makes raising equity on public markets difficult and expensive. Brookfield is privately held and it has a specific aim of investing in renewable power and climate transition assets, so I would expect that its investors would understand the long-term nature of the investment required, and it has made public commitments to invest. Accordingly, under Brookfield ownership, the constraints inherent in being ASX listed will be removed, enabling faster direct investment in renewable assets while also allowing Origin to invest across the energy value chain. This is a benefit which affects all aspects of capital investment, enabling faster and larger rollout of renewables as well as investing in innovative customer solutions to deliver renewable energy at the times needed.
70. The supply of retail energy services increasingly requires scale to fund best-in-class technologies. In the future, as noted at paragraphs 54 – 63 above, more customers will have distributed assets and this will lead them to want different products at different times. This requires more sophisticated offerings by electricity providers in order to monitor and control distributed assets and ultimately allow the integration of more renewable energy.
71. Significant changes are being seen in particular with commercial and industrial customers. Many of these customers need to be actively showing their own customers and shareholders how they are achieving renewables and decarbonisation targets. These commercial and industrial customers are looking for ideas on how to meet their targets. They want direct linkage to projects; to be able to switch between different types of renewables (solar and wind); to vary the proportions from different sources; and to be able to add new distributed assets over time. Some customers are looking not only to be connected to renewable energy projects, but are also seeking additionality (i.e., purchasing renewable energy from new renewable projects being built in the NEM). In my experience, this has led to conversations with customers about how to manage their purchases, versus production from renewable projects which are largely not matched with a retail load. I provide some examples below (each of which relates to a different customer):
- (a) I made an offer to a customer to take output from the Stockyard Hill Wind Farm in Victoria matched against the NSW pool price. The customer asked for information on what the Stockyard Hill Wind Farm output profile might look like, which Origin provided. Ultimately, however, no deal was finalised.
 - (b) A customer had entered into a wind PPA with a third party that covered approximately 75% of their annual load, but covered only approximately 40% when matching supply and demand. We offered a product to the customer whereby we stepped into the PPA and then offered a price to “firm” periods where there was insufficient wind output and a price to purchase where there was excess wind. The customer entered into a two-year (2023-24 calendar years) deal on that basis.
 - (c) A customer asked Origin to develop a proposal that would achieve 24/7 renewable supply (matching demand with renewable supply every hour). We provided a proposal which included a combination of behind the meter assets (solar and

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batteries) as well as grid assets (wind PPA and a share of a grid scale battery). Ultimately this customer chose to take a standard energy supply deal, with an agreement to further explore the 24/7 renewable proposal.

- (d) We are currently working with a customer on a solution that includes behind the meter solar as well as orchestration of batteries, refrigeration and heating, ventilation and air conditioning (**HVAC**) assets, under a value sharing arrangement. Longer term we will also look to bring grid PPAs to this customer to help it manage its grid exposure.
72. Given these customer requirements and demands, the product offerings are becoming more complex and customer-specific. I have observed that this is leading to longer term deals with more flexibility built into them. Customers are looking to make sure that the products they are buying will be competitive in the longer term having regard to potential future market developments and pricing. For example, if the load shape (demand profile) changes, some customers will want to change the percentage of wind and solar.
73. To be able to provide customers with this level of flexibility, scale is important. Scale is necessary to be able to support the investment in the range and location of different renewable sources that customers are looking for, as well as being able to manage the demand requirements over time and provide as much stability in pricing as possible so that customers are not exposed to the pool price. The marginal cost of adding a customer is low and so there is a strong incentive to grow the customer base to support the investments that have been made and which need to continue to be made both in generation and in the digital capability.
74. As part of its VPP, Origin provides a benefit to customers with distributed energy resources. This may be in the form of a credit, a profit share or a lower tariff. However, Origin is not typically involved in the investment in building and owning distributed assets. Origin seeks to add these assets to the VPP in order to help the customer reduce the cost of electricity and balance demand and supply more effectively. Origin does not have the balance sheet capacity to finance those assets at scale. To fund such investments, Origin would need to find investors to finance such projects. Origin has had discussions with several funding providers; however, while there is appetite for investing in this asset class, this would require Origin to scale the solution on balance sheet at a relatively higher cost of capital, in order to demonstrate the viability of the asset class to outside investors.
75. This has constrained Origin's ability to offer end-to-end products to consumers. To do this, the following would be needed:
- (a) **investment in end-to-end customer experience:** this requires an integrated proposition of sales, installation, financing, and supporting technology backbone. Origin to date has not been involved in this aspect of the process (i.e. initial sales, design, and installation);
 - (b) **a financing platform:** this requires significant balance sheet capacity to finance assets at scale. This has previously been an unattractive position for Origin due to its limited balance sheet capacity and the lower returns for this asset class compared to Origin's cost of capital, for such investment as a public company; and
 - (c) **asset orchestration:** this involves co-ordinating the dispatch of distributed assets in order to lower the costs of supply from both a wholesale and network cost of supply point of view. Some assets on the platform also have the ability to supply the grid in periods of high demand and high wholesale prices. The platform can also minimise the carbon intensity for customers by moving demand to periods of

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high renewable generation. This requires a software platform and communication capabilities in order to control assets.

76. Origin is only involved in the third activity above (asset orchestration). A key disadvantage of this is that it can lead to missed opportunities. For example, Origin may never be introduced to a customer who is interested in the services it provides under (c) above, if Origin is not involved in the initial stages in (a) or the financing (b), or it may only win opportunities under (c) if other providers who offer (a) and (b) are not interested in offering (c). By contrast, a company involved in all three aspects can offer customers an end-to-end solution. However, in order to do all three activities successfully, a low cost of capital is required (in particular for (b)) along with competitive access to the supply chain (in particular for (a)). Origin has considered building a platform to offer all three services to customers, but it would need to bring in third parties to perform (a) and (b) which would not be as efficient as doing these itself if it had the balance sheet capacity and competitive access to the supply chain to do so.
77. In contrast, with Brookfield ownership, Origin would be able to be involved fully in the value chain which would simplify the product offering to customers and facilitate all the steps above, and would thereby enable renewable energy to be delivered more efficiently and likely at lower cost for customers.

Accelerate renewable and cleaner energy

78. Under Brookfield ownership, the increased access to capital to fund investment in renewable assets would allow Origin to decarbonise more rapidly than it would otherwise do so. Under the CTAP ██████████ Origin expects to decarbonise at a similar speed as the market. As a combined entity, I consider that Origin would be able to decarbonise more rapidly than the market.
79. Within the NEM (comprising much of eastern Australia), it is expected that 44 GW of renewable generation needs to be built by 2030, with 28 GW of grid scale generation and 16 GW from behind the meter. In addition, 15 GW of firming generation is required to be built.²⁰ It is important for a company involved in generation and retail, such as Origin, to be able to combine a portfolio of renewable generation and high value firming capacity. These assets are financed at very low returns reflecting stable cash flows and the assets are often very highly geared. The Origin balance sheet is characterised by commodity risk (e.g. oil price, gas price, and coal price). Consequently, Origin's gearing is lower to hold a buffer to adverse commodity exposures. Origin on its own would not be competitive given its balance sheet composition and so would have to partner with a funds provider, but this gives rise to the challenges identified at paragraph 48 above. Brookfield ownership would provide direct access to funds, bringing the capital to deploy into that investment in renewable assets.
80. As regards battery storage projects in particular, because of Brookfield's advantages of global scale and footprint, and due to its track-record of battery storage investments to date, I consider that Brookfield is likely to have a faster roll out plan than Origin, which would lead to more rapid deployment. In that regard, Origin's peaking open cycle gas turbine plant sites are well-suited for battery storage as they have a lot of spare land and good network connection. Battery storage would mostly be running when the turbines are not running.

²⁰ See, e.g., Origin Energy CEO Frank Calabria's CEDA address, 'Delivering the biggest infrastructure challenge in a century' (22 November 2022): <https://www.originenergy.com.au/about/investors-media/delivering-the-biggest-infrastructure-challenge-in-a-century/>. See also AEMO, '2022 Integrated System Plan' (ISP, June 2022).

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81. More generally, Brookfield's global buying power and supply chain relationships could provide more timely and reliable access to equipment, as well as lower pricing from suppliers. Brookfield's global demand and scale is likely to mean that it can access supply chain arrangements and pricing that Origin is unable to match.
- (a) By way of example, Origin does not have ongoing supply arrangements with equipment manufacturers or construction providers with expertise in renewable projects. Instead, our approach to renewable projects is generally to seek a "fully-wrapped" EPC contract for a specific project as that project approaches FID. Origin has a low risk tolerance for project risk and seeks to move risk onto the EPC provider. In the past this has resulted in high quotes which has seen projects fall below the required return for a successful FID.
 - (b) By contrast, having more buyer power and expertise in construction, and the ability to risk-manage renewable construction projects, would result in a lower overall cost of completion: pricing could be sought on the basis of a committed volume of potential projects, and where more of the risk is borne by the developer rather than the design or construction contractor. This would result in a lower cost in the transition to renewables as well as potentially resulting in some projects coming to market that may not have met the required return under an EPC arrangement for a specific project.
 - (c) Further, Origin's current approach results in [REDACTED]
[REDACTED] Untimely unfavourable movements in foreign exchange rates, equipment costs, or contractor risk margins can then lead to projects being stalled or abandoned at a late stage. In contrast, a company that is purchasing renewable equipment regularly and managing multiple construction projects will have greater visibility of these types of project risks, and is likely to be able to more actively manage these risks giving them more confidence to undertake project development activities.
 - (d) While the latter approach [REDACTED] a combined Brookfield/Origin would be likely to be better placed to do so, as it would be able to allocate potential contractors (or volumes of inventory such as solar panels or batteries) across a number of projects globally depending on timing and demand requirements, and might thereby be in a position to make a considerable volume commitment to a contractor beyond a single project.
82. In my view, Origin and Brookfield have complementary capabilities. Post-acquisition, Origin will have access to Brookfield's global renewables procurement capability, construction expertise and capital. Combined with Origin's existing ability to match customer demand to renewable projects, this will considerably speed up execution of renewable projects. The three interdependent elements of a new renewables project, namely a customer offtake agreement or PPA, financing, and analysis of the economics of the site (see paragraph 40(a) above), would be brought together within a single entity, which would de-risk and speed up the rollout of renewables projects. This would include building both generation assets (e.g. solar and wind) and firming capacity (e.g. battery storage) to support them.

Managing pricing volatility associated with the transition to renewable energy

83. As I have described at paragraph 53 above, wholesale prices will become more volatile as variable renewable energy enters the market. If there is not an effective way to manage this volatility, this will flow through to customers. A combined Brookfield/Origin entity will be better placed to manage the increasingly volatile spot price for electricity through:

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- (a) increased ownership of different renewable energy assets which would ensure that variability in energy output can be managed across different and complementary renewable assets, such as solar and wind generation assets; grid-scale energy storage and firming assets; and a larger network of distributed energy assets. This is something that Brookfield brings to the table with their ownership of such assets and their access to financing allowing them to invest in zero and low SRMC assets such as wind and solar generation and capital intensive energy storage assets;
- (b) having a flexible asset portfolio to cover the risk of price spikes from a volatile electricity market;
- (c) managing trading position and exposure by matching supply and demand in a decentralised market. Having access to robust data (which would be facilitated by deploying an end-to-end customer solution assisted by capital investment from Brookfield) will assist in managing this effectively; and
- (d) retaining a customer base, which will assist in hedging generation against volatile electricity prices.

Longer term horizon: investment in future technologies and risk management

84. I understand that, as a private company, Brookfield has a longer-term investment focus than Origin as a public company, and it also has a specialist focus on renewables and the climate transition, and therefore there is greater scope to support participation in emerging technologies such as hydrogen and offshore wind. I consider that these technologies will be relevant to Origin's medium to longer term transition goals (such as mapping the role hydrogen may play by 2050). In the long term there will come a point where customers have transitioned as much as they can using the currently available other technologies and options, and therefore hydrogen will be the next step.
85. Currently hydrogen is uneconomic as a fuel and hydrogen projects rely to a significant extent on government subsidies. At the moment, projects are generally in the trial phase. Hydrogen projects need government support, investment by an energy knowledgeable counterparty and large project skills. These projects are major undertakings.
86. It is particularly hard for Origin to invest in such technologies as a public company due to the return profile of investing in such technologies at this stage.
87. Brookfield ownership of Origin could alter Origin's approach to these technologies and enable it to accelerate its involvement in investigating and investing in these technologies.
88. The future energy eco-system will have more complex risk management across different asset types. The conventional energy market followed well-established methods in managing risk. In order to manage fuel risk, Origin has entered into fuel supply contracts in order to manage exposure to fuel prices. In order to manage its contracting position, assets are operated to hedge contracts and demand.
89. By contrast, the future energy market will require a range of products in order to manage risk, due to the increased complexity of the market. For example, a diverse portfolio of generation assets will be required in order to hedge against high or volatile wholesale prices; a large portfolio of low-cost renewable assets will be needed to provide bulk energy; orchestration of distributed energy resource assets through VPPs will be needed in order to make use of dispatchable capacity; and active management of commercial and industrial contracts will be needed to ensure portfolio supply and demand are matched. Brookfield's access to capital and its experience in its international portfolios of assets of the type required, combined with Origin's existing expertise, would help to build up the portfolio of assets required to manage this risk effectively.

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E. ORIGIN'S APPROACH TO HEDGING, AND THE EFFECT OF AN ACQUISITION BY BROOKFIELD IN LIGHT OF THIS

Origin's approach to managing risk in its energy portfolio by hedging

90. As a vertically integrated organisation, Origin has some ability to manage against price risk in relation to the electricity it supplies to its customers from its own assets. However, Origin is a net buyer of electricity from the market, which means that it generates less electricity from its assets than it sells to its customers: it is structurally short. Specifically, around half of Origin's energy requirement, and around two thirds of maximum peak customer demand, can be covered by Origin's generation fleet, and the remainder must be covered by short and long term contracts.
91. There is price risk associated with Origin's net demand exposure (retail load minus generation), in particular in circumstances where Origin would be required to purchase electricity from the pool at prices for supply that exceed the fixed price sales to customers (and where generation from Origin's portfolio of coal, thermal peaking, and hydro assets does not fully offset the exposure from these electricity purchases).
92. Origin, accordingly, employs a hedging strategy that aims to reduce this pricing exposure combined with exposures across the business (e.g. as a result of fluctuations in the prices of commodities), and maximise value across all elements of the value chain in which it participates. Origin's net demand exposure is managed through hedging with various financial products, including options and structured contracts. Origin also has volumetric exposure in circumstances where actual supply or demand differs from the forecast supply demand that forms the basis of Origin's hedging decisions.
93. Origin deploys a hedging strategy established to deliver an exposure level that is consistent with the Board's risk appetite and Origin's Risk Management Policy and Commodity Risk Management System. Origin's Board establishes a consolidated risk limit which management allocates across commodity, financial and operational risks. A combination of Earnings at Risk and Short-Term Risk (stress test) limits are applied to the electricity portfolio, with appropriate measures and limits applied to other commodities.
94. In addition to hedging with the financial products outlined above, Origin uses its gas peaking generation plants (including Mortlake, located in Victoria) to manage its position. These plants are used in order to cover extreme day events, such as very high temperatures and where there is increased electricity demand. Due to the way in which Origin procures electricity, Origin only runs these plants when the cost of buying electricity from the market is higher than their SRMC and where there is continuous demand at elevated prices.

Hedging and the effect of an acquisition by Brookfield

95. Given Origin's structurally short position in Victoria and the manner in which it has hedged its position to manage price exposures, in my view, a combined Brookfield/Origin would be incentivised to keep electricity prices low and electricity generation high in the NEM, as is the case at present. Specifically:
- (a) Origin has no coal assets in Victoria or long term firm energy offtake agreements. Origin's only long term supply in Victoria is the variable renewable output from the Stockyard Hill wind farm which supplies about [REDACTED] of Origin's Victorian demand. This deal ends in 2030. As part of its hedging strategy, Origin buys short term futures cover and buys from the NEM pool. Consequently, Origin prefers the pool price to be lower;

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- (b) low average prices would incentivise Origin to continue to buy at the pool price;
 - (c) Origin's hedge book has a number of long term cap contracts. This means that as the NEM pool price rises from \$150 to \$300 these cap contracts are triggered and start to protect Origin's book from high pool prices (the term "book" is the expression used to describe the portfolio of electricity demand Origin must supply to its customers); and
 - (d) Origin's strategy is to cover the retail position for a high demand day, for example driven by hot temperatures. Origin usually has the ability to cover such a position or is a little short of this position. As a result, if the price is at the Market Price Cap (MPC), it would depend on Origin's load and demand position. Structurally Origin would need to buy [REDACTED] MW of future contracts each quarter to cover this retail load. If the pool price is high then the cost of hedging in the futures market or on the spot market is higher still and this is disadvantageous to Origin.
96. Where there are very high average prices, it might be posited that a combined Brookfield/Origin entity could discriminate and for example seek to engage in unplanned maintenance on another generator's line. However, the Service Target Performance Incentive Scheme (STPIS) incentivises transmission availability in periods of high price. Moreover, the market operator can override maintenance in periods of tight demand-supply balance where such behaviour would have a market impact.

Signature of witness

[REDACTED]

Anthony Robert Lucas