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AGL: AN ELECTRIC UTILITY DEALING WITH DISRUPTIVE INNOVATION

Tom Houghton and Philip Sugai wrote this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

AGL Energy (AGL), an Australian company with its origins on the country's eastern seaboard, was responsible, in 1841, for providing the first gas lighting to Sydney's residents. By March 2016, the company had become an integrated energy provider that generated AU$10.7 billion[1] in annual revenues in FY2015 from its operations in New South Wales, Victoria, South Australia, and Queensland. Like many other utilities, AGL was facing significant challenges to its electricity business. Sales were in decline and, while customer numbers had been increasing year-over-year, 2015 saw the first net *decrease* in the company's recent history.

In February 2015, AGL appointed a new chief executive officer, Andy Vesey, who had previously held an executive role at a global power generation company listed on the New York Stock Exchange.[2] The arrival of a new chief executive officer had already had a positive effect on the company's share performance beginning in 2015 (see Exhibit 1). Not long after his appointment, Vesey announced that AGL was establishing the goal of installing one million smart connections to consumers and businesses by 2020. As the *Australian Financial Review* reported at the time, ". . . his enthusiastic portrayal of [the] future energy supply system . . . gave some the impression that Vesey was shaping up as an industry disruptor."[3]

While Vesey rejected the "disruptor" label, he saw a need to transform AGL's business model, stating that ". . . the way we make money today may not be the way we make money tomorrow. I can't tell you what [the future] looks like, but I'm open to recognize that we are going to change and the change is going to be significant, and I'd rather be out in front of that than trailing behind it."[4] AGL's commitment to new energy products was confirmed by Vesey in May 2015 when he stated that he expected "new energy" to underpin retail growth and provide potentially new revenue streams (see Exhibit 2).

To that end, AGL declared it would be the first major Australian energy retailer to launch a battery storage product providing ". . . consumers with backup for essential home services such as lighting, refrigeration, and communications."[5] However, many questions remained: What were the risks of AGL being left with stranded generation assets? How would customers respond to these new services? How could AGL effectively monetize the value of energy-savvy customers in order to sustain revenues and profitability? How could it identify and capitalize on the new lightning rod targeting customers? And most importantly, what would be the best strategy to implement in light of the answers to these questions?

ELECTRICITY SUPPLY INDUSTRY BACKGROUND

The electricity supply industry (ESI) had undergone profound changes over the course of the 20th century, but the technological challenges and global trends faced at the start of the 21st century were arguably the most significant yet (see Exhibit 3).

When electricity first became available in the early part of the twentieth century, it was very much a local affair with small generating companies, often municipally owned, sprouting up in towns and cities to provide electricity to homes, businesses, and municipal services such as street lighting. Later, as technology developed, it became apparent that economies of scale were to be gained by building larger power plants; most electricity was generated by burning coal and the larger the plant, the more efficient the process of turning heat into electricity.[6] These plants were no longer built close to where electricity was used, but close to where the natural resources (e.g., coal and water) lay. At the same time, it became more feasible to transport electricity efficiently, and the second half of the 20th century saw the emergence of large-scale, high-voltage networks connecting power stations and load centres.[7]

Early in the new millennium, faced with concerns about climate change and rising fossil fuel prices, a revolution began in the ESI. Renewable forms of electricity generation, such as solar photovoltaic (PV),[8] were encouraged through feed-in tariffs[9] resulting in a partial return to localized generation. Improved efficiency and dramatically falling prices meant that solar panel installations on the rooftops of residential and commercial properties, especially in sunny locations like the U.S. southwest, had become commonplace. In Australia, where the rooftop solar revolution was arguably the most advanced globally, it had been estimated that 1.4 million solar PV systems had been installed, representing 16 per cent of all households, by the end of 2014.[10]

Electricity markets were designed to allow market participants to establish prices that matched supply and demand: one of the unusual features of electricity systems was that supply and demand had to *instantaneously* be in balance to prevent voltage and frequency fluctuations that could result in the failure of devices connected to the system.[11] Keeping this balance was the job of the system operator, a role usually undertaken by the transmission provider.

The daily pattern of electricity consumption was frequently characterized by two peaks: one in the morning when households woke up, and a second one in the evening when residents returned home. In the past, generation (i.e., supply) was largely "dispatchable," meaning it could be called upon to deliver power when demanded. Renewable generation was considered "non-dispatchable," because it was inherently unpredictable and out of the control of the system operator. Typical daily fluctuations of wind and solar generation superimposed on the daily load curve (see Exhibit 4). Two features were of note: the first was the short time frame variability of generation from these renewable sources (evidenced by the jaggedness of the profile, especially for wind); the second was the fact that peak generation did not correspond in time to the peak load.

In most energy markets, (e.g., oil and gas), keeping supply and demand in balance was partially achieved through storage in tanks or pipelines. The only cost-effective way of storing electricity was using so-called "pumped storage plants" in which water was pumped uphill to a reservoir when electricity prices were low (e.g., at night) and stored there before being used to generate electricity when prices were high (e.g., in the evening). These projects suffered many of the same issues faced by any new hydro plant such as high capital costs and change of land use.[12] While interconnected networks helped to mitigate the problem of not being able to easily store power, many hoped that the falling cost of battery storage would provide a cheaper way of balancing supply and demand.[13] Reducing the cost of battery storage also raised the very real possibility

of consumers moving completely off-grid. In light of this, Tesla Motors' first home installations in Australia of its PowerWall home batteries had begun in February 2016 with clear indications that there was a strong and growing demand for such solutions.[14]

AGL'S BUSINESS ENVIRONMENT

AGL was both a generator and a retailer of electricity, and a wholesaler and retailer of gas to residential and business customers. It was the largest generator in the National Electricity Market [15] by installed capacity (see Exhibit 5) and boasted some 3.7 million customers, making it one of the largest retailers alongside Origin Energy.[16] The company had continued to grow overall sales revenues, helped partly by acquisitions such as Macqaurie's generation assets in 2014 (see Exhibit 6).[17]

The return to a more distributed picture of electricity generation had left utilities, including AGL, with a multitude of challenges as outlined below. These challenges were sometimes described as a "death spiral" of increasing costs and declining revenues that squeezed profitability.[18] As a major thermal power producer and retailer of electricity, AGL was not immune to the effects of wholesale market volatility and fleeing customers.

Falling Demand: Demand for electricity from the grid had begun to decline owing to factors such as improved efficiency of end-user devices and more customers generating their own power (see Exhibit 7).

Loss of Customers: In light of the very real possibility of customers deciding to move to stand-alone systems and leaving the grid entirely, utilities faced the prospect of declining customer numbers. This implied a loss of revenue but also suggested that any capital investments would need to be recovered from a smaller customer base, leading to increased unit costs and lower profitability for energy suppliers.

Increased Complexity: Incorporating more intermittent renewable generation into the system brought with it more complexity and potentially higher costs. Future smart grids offered the prospect of helping system operators to manage intermittent supply and fluctuating demand, but such improvements required investment in technologies such as smart meters, the cost of which was difficult for utilities to pass on to customers.

Uncertain Pricing: More frequent occurrences of price spikes and the very real possibility of negative prices affected the bankability[19] of power generation investments, which had traditionally been predicated on stable income streams and were well-suited to debt financing. Firms' cost of capital for projects was increasing, which raised the concern about under-investment in power generation.[20] Since renewable generation contributed to carbon-reduction targets, legislative and system operation regimes usually prioritized these forms of generation over fossil fuel plants. As mentioned above, it was the job of dispatchable fossil fuel generators to adjust supply up and down to fit demand variations,[21] but it was sometimes cheaper for thermal plant owners to pay renewable generation firms to disconnect rather than adjust output themselves. This led to the strange phenomenon of negative prices in the electricity wholesale market as thermal generators paid for the privilege of producing power.[22]

In the face of these challenges, a war of words had been heating up in 2015, with consumers blaming increases in electricity prices for their decision to move to solar PV; the index of Australian residential electricity prices seemed to support this view (see Exhibit 8). Real prices had more than doubled between 1999 and 2013, and, while there was a moderate readjustment in 2014 (mainly the result of the removal of the carbon tax), this had done little to assuage consumer dissatisfaction. Consumers believed that utilities were exploiting their monopoly position in an anti-competitive way to the consumers' detriment.

Utilities, meanwhile, had been lobbying governments hard to lower renewable energy targets and, in some cases, were asking for a total halt on the installation of rooftop solar PVs. Furthermore, they had begun to impose additional tariffs on customers for the right to connect to the grid, lowering the value proposition of PV installations. Utilities argued that they were being treated unfairly; unless completely off-grid, customers could choose when to use the grid and when not to, while utilities had a regulated obligation to provide service at all times. Energy companies were required to maintain their grid assets and continue to offer the same level of service to consumers while, at the same time, they suffered from falling revenues and lower profitability. This hindered their ability to maintain and upgrade the grid, which had always been considered a valuable asset, and thus, increased the risk of grid failures while ultimately leading to much poorer customer service.

The situation had often been referred to as the "Uberization" of utilities, a reference to the emergence of the Uber taxi service, which also represented a challenge to the business model in a regulated sector. The big difference, however, was that while Uber affected the value of taxi licences valued at a few hundred thousand dollars each, the move to a new electricity model potentially put in jeopardy an asset worth hundreds of billions of dollars. Moreover, the failure of a taxi to arrive was likely to be no more than an inconvenience; the failure of the grid could be catastrophic.

TIME FOR A DIFFERENT CUSTOMER RELATIONSHIP

By the middle of 2015, it was becoming clear that without a fundamental shift in attitude on the part of consumers and utilities alike, the situation was likely to reach an impasse. The increasing dissonance evident between utility and consumer was to the detriment of all in the industry. Observers and market participants had long been talking about the future competitive battleground being "beyond the meter,"[23] and industry players were starting to seriously consider what this might mean. The following statements from AGL's 2015 Annual Report spoke to the issue:[24]

"We're focused on delivering new, innovative, and integrated offerings to meet the changing needs of our customers." [25]

"The industry, both in Australia and around the world, is undergoing significant change. Consumers are now more aware of their energy consumption and digital technologies have enabled and increased customer expectations for price transparency and control."[26]

In the past, interest in solar power had largely been confined to individuals with strong environmental motivations (so-called "green consumers") but the market was clearly changing in 2016 and a new breed of customer was emerging. This new consumer was more interested in energy consumption, embraced new technology, and valued independence. Understanding how to engage with these new energy-savvy consumers was seen to be crucial to a utility's future.

THE VALUE MINDSET

The idea of the *value* that a business provided to its customers, partners, and other key stakeholders had been the subject of active debate for centuries; the concept was an important element of philosophical thought dating back to the time of Aristotle and continued through history. Aristotle first proposed that value actually could be thought about and experienced in two completely different ways.[27] The first, and most popular in business and economics, was *exchange value*, which reflected the price that a buyer was willing to pay a seller for a specific product or service. The second, *use value*, represented a wide range of

benefits that was received from actually using a product or service, and included a wide range of outcomes, both intangible (e.g., satisfaction) and tangible (e.g., environmental impact). A shift in thinking away from exchange value and towards use value had been under way in executive suites globally, and even the definition of marketing had evolved to recognize the importance of value, beyond the profits that products and services generated.[28]

Stephen Vargo and Robert Lusch suggested that businesses and marketing must shift their thinking away from a "goods-dominant logic." This approach revolved around selling more products to more customers for the highest financial gain, while a "service-dominant logic" focused on optimizing use value between firms, customers, and society. Vargo and Lusch outlined their arguments in a groundbreaking paper in 2004.[29] In their book, *The Experience Economy*, Joseph Pine and James Gilmore[30] went even further, suggesting that experiences themselves flowed from such services, and it was these experiences that would become the most important asset for firms in the future.

Philip Sugai's book, *The Value Plan,*[31] described how these previous concepts could be brought together in a marketing strategy using 12 building blocks of value, each of which required deep thought and active discussions with potential customers, employees, partners, and the local community. In particular, it applied the idea of the Lightning Rod Target Customer (LRTC) from Mike Moser's *United We Brand*[32] and built on this to explore how the LRTC's worldview could be used to help understand the strategic changes that were necessary to ensure businesses could remain competitive as the overall industry went through massive transformation.

While focusing on value seemed intuitive in markets such as fast-moving consumer goods or service industries, the impact of such thinking in the energy sector had the potential to unleash unprecedented and possibly enormous disruptions in how energy companies such as AGL approached their customers, partners, and communities. A value-driven approach provided either an important next step in the evolution of energy sector business models, or accelerated the departure of customers from the grid to new models of energy generation, distribution, and storage.

Vesey and his team spent many months crafting the ideal strategy to address these challenges, but could he and his team have missed something critical?

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EXHIBIT 1: AGL SHARE PRICE SINCE JANUARY 1, 2014

Source: Yahoo! Finance.

EXHIBIT 2: AGL STRATEGIC OBJECTIVES FOR NEW ENERGY ACTIVITY

Short-Term	Medium-Term	Long-Term
Underpin retail value growth with: • Digital meters • Bundled products and services • Brand enhancement • Loyalty propositions	Install one million smart meters by 2020 and aim for leadership position in: • Metering services • Rooftop solar • Energy services • Energy storage • Electric vehicle services	Comfort and convenience; control of products and services • Remove complexity from homes • Remove inefficiencies at businesses • Remove network volatility

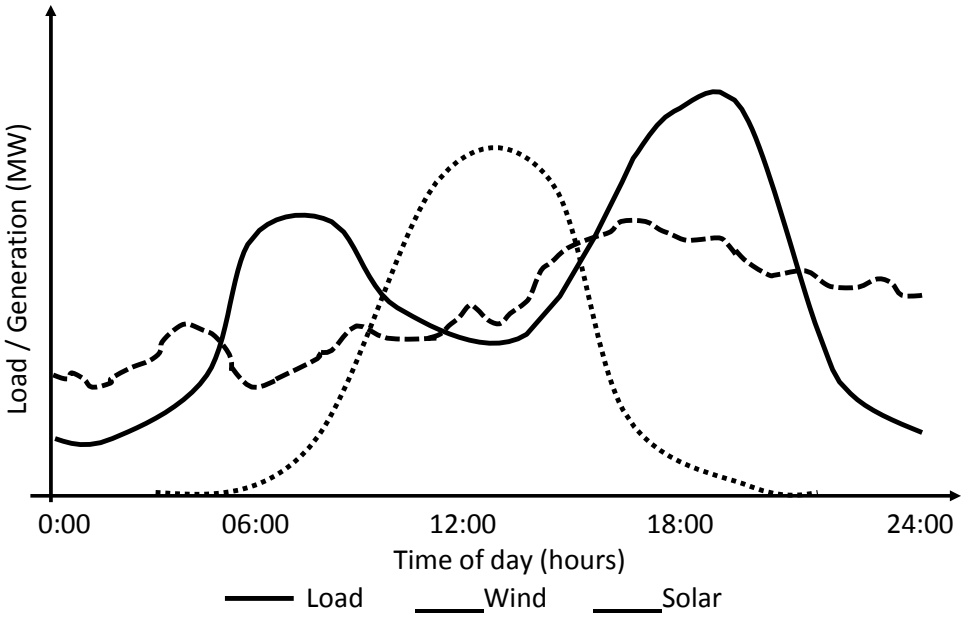
Source: AGL Energy, "AGL Presentation to Investors," accessed May 3, 2016, www.agl.com.au/-/media/AGL/About-AGL/Documents/Investor-Centre/2015/Strategic-Roadmap/09_Invest-in-business-models-which-exploit-new-technologies.pdf?la=en.

EXHIBIT 3: ESI ORGANIZATION

Generation companies produce electricity from coal, gas, oil, and renewable sources such as hydro and wind. They sell power to the retail companies. Some small-scale generation, connected directly to the distribution network, is referred to as embedded generation.	**Transmission and distribution** companies own all the assets for transporting electricity between and within regions. They physically connect generators and retailers; they are natural monopolies.	**Retail** companies supply electricity to end-customers and purchase power from the generation companies.	Everything that happens in the customer's home is referred to as "**beyond the meter**" and has traditionally been considered separate from the ESI itself. With the emergence of home generation and energy system management, this boundary at the meter is becoming blurred.

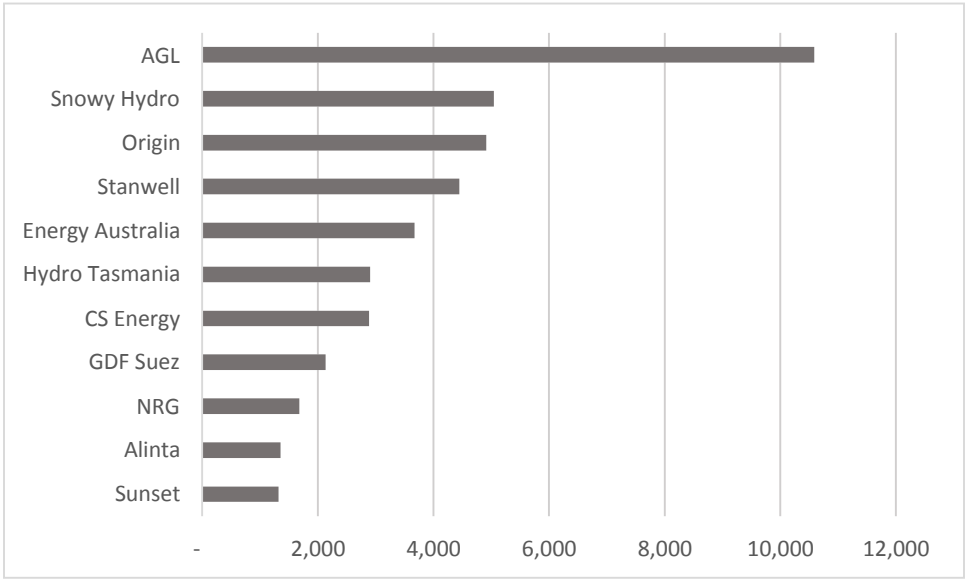
Source: Authors' analysis.

EXHIBIT 4: LOAD AND GENERATION PROFILE EXAMPLES



Note: MW = megawatts.
Source: Authors' analysis.

EXHIBIT 5: NATIONAL ELECTRICITY MARKET PARTICIPANTS BY INSTALLED CAPACITY (GENERATING COMPANIES WITH >1 GIGAWATT OF CAPACITY)



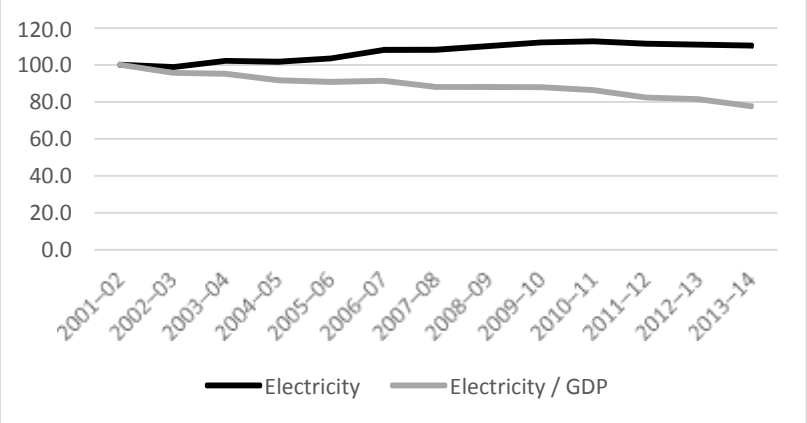
Source: Company websites and annual reports.

EXHIBIT 6: FIVE-YEAR PERFORMANCE SUMMARY FOR AGL

Year Ended June 30		2015	2014	2013	2012	2011
Financials						
Revenue	AU$m	10,678	10,445	9,716	7,456	7,073
Statutory Profit	AU$m	218	570	375	115	559
Underlying Profit	AU$m	630	562	585	482	431
Underlying EPS	AU cents	96.4	96.9	102.2	96.1	87.9
Customer Numbers						
Electricity	’000	2,280	2,316	2,146	2,084	1,925
Gas	’000	1,455	1,484	1,371	1,390	1,369
Total	’000	3,735	3,800	3,517	3,474	3,294
Sales Volumes						
Electricity						
Consumer	Gigawatt hours	14,180	14,839	15,276	15,410	14,674
Business	Gigawatt hours	12,798	12,963	14,714	17,374	18,090
Total	Gigawatt hours	26,978	27,802	29,990	32,784	32,764
Gas						
Consumer	Petajoules	63.0	57.6	60.6	60.1	62.6
Business	Petajoules	79.1	80.6	85.5	81.9	89.1
Wholesale and Generation	Petajoules	92.0	66.0	55.0	48.8	64.5
Total	Petajoules	234.1	204.2	201.1	190.8	216.2

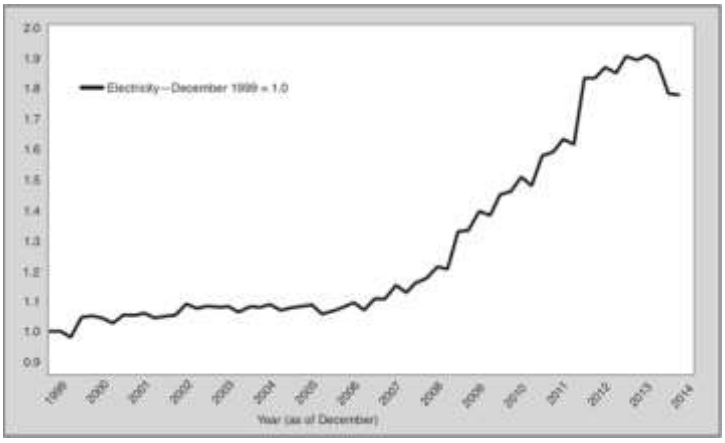
Note: Earnings per share: restated for the bonus element of the one-for-five share rights issue completed in September 2014.
Source: AGL, “2015 Annual Report,” August 26, 2015, accessed June 8, 2016, www.agl.com.au/about-agl/investor-centre/reports-and-presentations/annual-reports.

EXHIBIT 7: AUSTRALIAN ELECTRICITY CONSUMPTION INDEX 2001/02–2013/14 (2001/02 = 100)



Note: GDP = gross domestic product.
Source: Australian Bureau of Statistics, “Australian National Accounts: National Income, Expenditure, and Product, Mar 2016,” accessed May 3, 2016, http://abs.gov.au/ausstats/abs@.nsf/mf/5206.0; “Australian Energy Statistics,” Australian Government, Department of Industry, Innovation, and Science, accessed May 3, 2016, www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Pages/Australian-energy-statistics.aspx#.

EXHIBIT 8: CONSUMER PRICE INDEX-ADJUSTED AUSTRALIAN HOUSEHOLD ELECTRICITY PRICE INDEX



Source: Australian Bureau of Statistics, "Consumer Price Index, Australia, Jun 2016," accessed May 3, 2016, http://abs.gov.au/ausstats/abs@.nsf/mf/6401.0.

ENDNOTES

[1] AU$ = Australian dollars; all currency amounts are in Australian dollars unless otherwise specified; AU$1.30=US$1 as of June 30, 2015.
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[4] Ibid.
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[13] Jessica Shankleman, "Is Tesla's Powerwall Battery a Utility Killer?" *GreenBiz*, May 4, 2015, accessed February 1, 2016, www.greenbiz.com/article/teslas-3000-powerwall-battery-utility-killer.
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[15] The National Electricity Market, despite its name, covers the interconnected network on the Eastern Seaboard of Australia. In a recent decision, the market in Western Australia will be brought under the National Electricity Market umbrella despite the fact that it is not physically interconnected with the East.
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[21] This concept is often referred to as "load following," the ability of the plant output to follow changes in demand, or load.
[22] "How to Lose Half a Trillion Euros: Europe's Electricity Providers Face an Existential Threat," *The Economist,* October 12, 2013, accessed June 3, 2016, www.economist.com/news/briefing/21587782-europes-electricity-providers-face-existential-threat-how-lose-half-trillion-euros.
[23] "Beyond the meter" refers to the part of the electricity system that is on a customer's premises (see also Exhibit 4).
[24] AGL Energy, "2015 Annual Report," August 26, 2015, accessed June 8, 2016, www.agl.com.au/about-agl/investor-centre/reports-and-presentations/annual-reports.
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