Submission No 19

ELECTRIC BUSES IN REGIONAL AND METROPOLITAN PUBLIC TRANSPORT NETWORKS IN NSW

Organisation: AGL Energy

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Ms Robyn Preston MP

Chair

Legislative Assembly Committee on Transport and Infrastructure

Parliament of New South Wales

Macquarie Street

Sydney NSW 2000

20 December 2019

Dear Chair,

Inquiry into electric buses in regional and metropolitan public transport networks in New South Wales

AGL Energy (AGL) commends the New South Wales (NSW) Parliament for launching the inquiry into electric buses in regional and metropolitan public transport networks in NSW, and welcomes the opportunity to make a submission.

AGL is one of Australia's largest integrated energy companies and the largest ASX listed owner, operator, and developer of renewable generation. Our diverse power generation portfolio includes base, peaking, and intermediate generation plants, spread across traditional thermal generation as well as renewable sources. AGL is also a significant retailer of energy, providing energy solutions to around 3.72 million customers throughout eastern Australia. In NSW, AGL operates solar, wind, gas, and coal generation, supporting local communities and thousands of local jobs.

In addition, AGL is continually innovating our suite of distributed energy services and solutions for customers of all sizes. These behind-the-meter energy solutions involve new and emerging technologies such as energy storage, electric vehicles (EVs), solar PV systems, digital meters, and home energy management services delivered through digital applications.

Maximising benefits through an integrated approach to NSW bus fleet electrification

EVs present an excellent opportunity for Australian cities; in particular, electric bus fleets are a clean, efficient, quiet transportation mode that will lower emissions and be cheaper to run over time. The increased uptake of electric vehicles also has the potential to limit vehicular air pollution and improve air quality, delivering significant health benefits to NSW communities, particularly in metropolitan areas.

NSW's transition to electric buses presents valuable and achievable opportunities for NSW. Beyond small scale trials, there is no Australian precedent for full fleet bus electrification (in fact, fully electrified bus fleets outside of China are rare). NSW could well set the precedent and lead the way for other Australian states and cities to make the same transition.

The electrification of NSW's bus fleet presents both transport and energy challenges and opportunities. Discussed in more detail below, these opportunities span energy supply, charging strategy and management, and vehicle procurement. There is a major opportunity for NSW to take a truly integrated

approach to the transition, which would ideally underpin all related tender and trial processes to maximise the likelihood of a successful and efficient rollout.

Alongside this parliamentary inquiry, we note there are other related processes, including the NSW Government's two-year trial of electric buses in Sydney's inner-west, and the NSW Government's announcement of a competitive tender process for all 13 of Sydney's metropolitan bus contracts. Streamlining these processes in consultation with the entire supply chain is key to ensuring NSW can capture the maximum economic, social, and environmental value from the transitioning to electric buses.

Minimum energy and infrastructure requirements to power electric bus fleets

The electrification of the NSW bus fleet will require careful, integrated planning and early road-mapping of the required technology and infrastructure. This will assist in managing the electrified fleet's immediate impact on the network, and help integrate new, low-emissions supply into the network. While the various aspects of transportation procurement are usually considered separately, fleet electrification will require joint consideration of all aspects to ensure interoperability, including:

- **Energy supply:** the electrification of NSW's bus fleet will increase NSW's electricity demand across the system, with local impacts and opportunities determined by depot locations and/or bus routes (depending on the charging strategy). This will require new, locally generated, green energy supply which will not only power buses, but will support jobs and the NSW economy, help to bolster NSW's energy security, and assist NSW in meeting its 2050 net zero carbon emissions target. Moreover, distributed energy resources such as solar and battery storage may be able to significantly reduce the cost of energy supplied to a bus fleet while reducing emissions (where they are appropriately sized);

- **Charging strategy and infrastructure:** alongside this new source of demand, charging infrastructure will need to be deployed and integrated into the electricity network. A key choice here is whether the bus fleet will be charged at depots or en-route, or a combination of the two. The charging solution should be consistent throughout the network to provide flexibility and to support reliable service provision, but recognise that individual depots will vary widely in their capacity to support e-bus charging at scale. As a result, the optimal solution will only be identified through an integrated, system-level approach;

- **Vehicle selection:** the choice of charging strategy must be considered against the implications for vehicle selection. Large capacity batteries allow for long intervals between charging but drive up cost of vehicle procurement, whereas lower cost batteries will need to be charged more often. This necessitates the systems approach above, including consideration of the rolling stock, depots, and route-based infrastructure;

- **Charging management:** the approach to charging management must consider both the availability of a charged bus fleet to support optimal service provision to transport users, as well as network and system impacts associated with supporting this new source of demand. For example, if all buses located at a depot commenced charging at the same time, this could create or exacerbate electricity system constraints. Smart charging may alleviate or even address constraints while maintaining full operational availability of the bus fleet. Smart charging would also minimise infrastructure requirements and thereby the cost of infrastructure rollout.

  Charging management has recently been demonstrated through AGL's *Peak Energy Rewards – Managed For You Program*. The program trialled remote EV charging management during peak events for AGL customer-owned vehicles in NSW, and showed that peak loads may be addressed

through smart charging of vehicles. AGL is currently investigating how this technology may be operated at scale, including potentially discharging of vehicles while parked to solve wider electricity system issues. This demonstrates the enormous potential for active management of the entire NSW electric bus fleet, and underscores the value of taking a holistic approach to the system design and operation; and

- **Orchestration:** charging management also presents new opportunities for system-wide optimisation and orchestration, by joining an increasing volume of distributed energy resources that are digitally enabled and capable of orchestration to support the broader reliability and security of the NSW grid. AGL continues to explore the potential for broadscale orchestration through our South Australian Virtual Power Plant, the learnings from which could be applicable to a project such as the electrification of the NSW bus fleet.

AGL would be pleased to lend expertise to this integrated energy and transport planning based on our current generation portfolio, our experience in energy innovation, our growing investment in e-mobility, and our already strong presence in the NSW market.

The value of road-mapping, trials, and government support

AGL recommends that a road-mapping model be considered for NSW bus system electrification, to establish goals, milestones, gaps and barriers, actions, priorities, and timelines. The roadmap would engage bus system stakeholders for a commitment to shared objectives, and would be a living process subject to iteration based on learnings acquired through trials and pilot programs.

Early trials and pilot programs may be a useful step before broadscale rollout, providing a period of 'test and learn' before proceeding to full scale procurement and roll out. These trials could focus on the elements which distinguish an electrified bus fleet from more traditional approaches, including alternative options for charging, orchestration, vehicle selection, and infrastructure. We suggest these trials be conducted within the context of the system electrification roadmap above to ensure that the relevant questions are being addressed at each stage of the transition. Early Government commitment to road-mapping, trials, and pilot programs will also lessen infrastructure roll out costs.

Finally, we note the electrification of NSW's buses forms an integral part of the NSW Government's, *Future Transport 2056 Plan.* We consider that early and consistent consultation across the whole supply chain, funding of trials, and thorough technology and research mapping will ensure the bus electrification plan also aligns with the new, *NSW Electricity Strategy's* priorities of saving energy, supporting new generation, and bolstering NSW's energy resilience; and the *NSW Climate Change Policy Framework* objective of net-zero carbon emissions by 2050

AGL would welcome the opportunity to support NSW in planning for the electrification of the bus system. Should you have any queries in relation to the submission, please contact me on [redacted].

Yours sincerely,

[redacted]

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