Attachment D

Ramboll Memo

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ENVIRONMENT
& HEALTH

Delivered via Electronic Mail

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RE: RESPONSE TO FLASHMAN COMMENT LETTER ON MAGEE PRESERVE PROJECT REVISED DEIR

Dear Mr. Abbs:

April 26, 2019

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This letter is a response to a comment letter from Stuart M. Flashman dated October 14, 2018 regarding the Revised Draft Environmental Impact Report (DEIR) for the Magee Preserve residential development project. The commenter requests data regarding the percentage of cars in East Bay developments that are electric. The market for electric vehicles (EVs) is changing rapidly and thus, up-to-date data may not exist, and conservative assumptions need to be relied upon. There are many sources that indicate that residential EV charging is an important factor for increasing EV penetration.[1] While charging stations at work places and retail stores are becoming more widespread, most EV charging has historically taken place at homes, and will continue to do so.[2] An average vehicle spends 90 percent of its time at home and work, with over 70 to 80 percent of EV charging taking place at home, followed by workplace charging.[3,4] National Renewable Energy Laboratory's assessment for the California Energy Commission[5] found that home charging is the predominant location for charging, followed by workplace/retail charging, then public charging. In the near term, the California Energy Commission (CEC) believes

[1] Hidrue, M.K., G.R. Parsons, W. Kempton, and M.P. Gargner. 2011. Willingness to pay for electric vehicles and their attributes. Resource Energy Econ. doi:10.1016/j.reseneeco.2011.02.002. Available at: http://www.udel.edu/V2G/resources/HidrueEtAl-Pay-EV-Attributes-correctedProof.pdf. Accessed: February 2019.

[2] Holland, B. 2013. How important is charging infrastructure to EV adoption? GreenBiz. January 17. Available at: https://www.greenbiz.com/blog/2013/01/17/how-important-charging-infrastructure-ev-adoption. Accessed: February 2019.

[3] Ibid.

[4] Leemput, N. et al. 2015. MV and LV Residential Grid Impact of Combined Slow and Fast Charging of Electric Vehicles. Energies (2015), 8, 1760-1783. Available at: http://www.mdpi.com/1996-1073/8/3/1760.

[5] National Renewable Energy Laboratory (NREL). 2014. California Statewide Plug-In Electric Vehicle Infrastructure Assessment. Available at: http://www.energy.ca.gov/2014publications/CEC-600-2014-003/CEC-600-2014-003.pdf. Accessed: February 2019.

that "can't miss" locations are homes and multi-unit dwellings, followed by workplaces.[6]

A 2013 study conducted by the Institute of Transportation Studies at University of California, Davis explored the characteristics of 1,200 households who actually purchased a new plug-in vehicle in California during 2011-2012, with the overall target population of the survey being new plug-in electric vehicle (PEV) owners in California.[7] This study reveals that purchasing a PEV is associated in most cases with the installation of EVSE at home and the ability to plug the car to the power for charging.[8] In 2011, a report released by the National Research Council of the National Academies on the barriers to electric vehicle deployment pointed to lack of charging infrastructure deployment as one of those barriers, with 21.3 percent of survey respondents stating concern about access to charging infrastructure as the barrier.[9] Another study revealed that when asked about the critical factors that may influence their decision, the highest percentage (63 percent) of respondents cited the ability to charge at home [other factors included battery range, total operating cost, government subsidy].[10]

The program to install charging stations in residential areas has the potential to fulfill a gap in facilitating the level of EV conversion necessary for California to meet its stated penetration targets and associated emission reduction goals. Increased market penetration often results in a 'neighbor effect' of adoption: the more people see neighbors and friends successfully adopting EVs, the fewer perceived barriers remain.[11] In short, as EVs become more common due to reduced costs, increased availability of infrastructure and other incentives, members of the neighborhood/community without an EV will be increasingly more likely to purchase and use an EV.

EV penetration is also increasing faster than previously projected. Several recent studies have revised earlier forecasts of EV penetration to reflect higher-than-anticipated purchasing behavior and rapidly-falling battery costs. The California Air Resources Board's (CARB's) EMFAC software program, used by air districts to calculate vehicle emissions, was revised in 2017. As part of this revision, the current existing vehicle populations throughout the state were updated to reflect new vehicle registration data. There were 52% more EVs registered in California in 2016 than CARB projected in its EMFAC2014 model.[12] While EMFAC vehicle fleet projections only include new EVs required by existing legislation, it seems likely that this higher-than-anticipated EV uptake will continue and the vehicle fleet in the coming decade will contain more EVs than projected.

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6 Ibid.

7 Tal, G., M.A. Nicholas, J. Woodjack, and D. Scrivano. February 2013. Who Is Buying Electric Cars in California? Exploring Household and Vehicle Fleet Characteristics of New Plug-In Vehicle Owners. Institute of Transportation Studies at University of California, Davis. Research Report – UCD-ITS-RR-13-02. Available at: https://merritt.cdlib.org/d/ark:%252F13030%252Fm56692z3/1/producer%252F2013-UCD-ITS-RR-13-02.pdf. Accessed: February 2019.

8 Ibid.

9 Slavin, M.I. December 2013. Drivers and Barriers to Electric Vehicle Adoption. Published in EV World. Available at: http://evworld.com/article.cfm?storyid=2076. Accessed: February 2019.

10 Accenture. 2011. Plug In Electric Vehicles Changing Perceptions, Hedging Bets - Accenture end-consumer survey on the electrification of private transport. Available at: https://www.compromisorse.com/upload/estudios/000/144/AccentureElectricVehicle.pdf. Accessed: February 2019.

11 Nelson-Nygaard Consulting Associates Inc. 2014. Removing Barriers to Electric Vehicle Adoption by Increasing Access to Charging Infrastructure. Seattle Office of Sustainability & Environment. Available at: http://www.seattle.gov/Documents/Departments/OSE/FINAL%20REPORT_Removing%20Barriers%20to%20EV%20Adoption_TO%20POST.pdf. Accessed: February 2019.

12 CARB. EMFAC2017 webinar. June 1, 2017. Available at: https://www.arb.ca.gov/msei/downloads/emfac2017_workshop_june_1_2017_final.pdf. Accessed: February 2019.

Likewise, Bloomburg New Energy Finance (BNEF) produces a New Energy Outlook report each year. In its 2016 report, it projected that 35 percent of new cars sold would be electric by 2040. In its 2017 report, it increased that projection to 54 percent by 2040.[13] The 2018 estimate now projects that 55 percent of all new car sales and 33 percent of the global fleet will be electric by 2040. Current market trends and decreasing costs are driving EVs closer to cost parity with conventional gasoline or diesel vehicles faster than expected.[14]

Other reports predict a transformation from oil-based to electric transportation as soon as the early 2020s. Tesla recently began production of its Model 3 sedan, a long-range EV with a cost under $30,000 after rebates, and plans to ramp up production to 1 million per year by 2020.[15] Volvo committed to producing only EV and hybrids starting in 2019.[16] General Motors is already selling its long-range mid-cost EV the Chevy Bolt and investing heavily in research and technology.[17] BNEF reports that the number of EV models available for sale will jump from 155 in 2017 to 289 by 2022.[18] A new scientific analysis indicates that EVs could reach full cost parity with conventional vehicles as soon as 2022.[19]

In addition to more EVs on the road, the usage rate for EVs has been shown to exceed usage of conventional vehicles. An annual survey of California PEV owners[20] shows that even though many households with EVs also own a conventional gasoline or diesel car, they use the PEV for over 85 percent of work commute, personal errands, and shopping, while the conventional vehicle is the primary vehicle for vacation travel. The following year's survey shows that the average PEV owner drives 28.9 miles per day, which is well within the electric range of many eligible PEVs available in 2013.[21] In fact, according to the Department of Energy in 2017, "most [all-electric vehicles] have all-electric ranges of 80 to 100 miles"[22] and that range appears to be increasing. Between 2006 – 2010, the average commute time for Contra Costa residents was 32 minutes[23]; in 2017, commute times for

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[13] MIT Technology Review. July 5, 2017. Available at: https://www.technologyreview.com/s/608231/by-2040-more-than-half-of-all-new-cars-could-be-electric/. Accessed: February 2019.

[14] Bloomberg New Energy Finance. New Energy Outlook 2018. Available at: https://about.bnef.com/electric-vehicle-outlook/. February 2019.

[15] Cadie Thompson. July 3, 2017. Elon Musk just revealed when Tesla will deliver its first Model 3 cars. Business Insider. Available at: http://www.businessinsider.com/elon-musk-revealed-when-tesla-will-deliver-its-first-model-3-cars-2017-7. Accessed: February 2019.

[16] Jack Ewing. July 5, 2017. Volvo, Betting on Electric, Moves to Phase Out Conventional Engines. The New York Times. Available at: https://www.nytimes.com/2017/07/05/business/energy-environment/volvo-hybrid-electric-car.html. Accessed: February 2019.

[17] Bill Vlasic. June 4, 2017. G.M. Wants to Drive the Future of Cars That Drive Themselves. The New York Times. Available at: https://www.nytimes.com/2017/06/04/business/general-motors-self-driving-cars-mary-barra.html. Accessed: February 2019.

[18] Bloomberg New Energy Finance. New Energy Outlook 2018. Available at: https://about.bnef.com/electric-vehicle-outlook/. February 2019.

[19] Schmidt, O., Hawkes, A., Gambhir, A., and Staffell, I. July, 2017. The future cost of electrical energy storage based on experience rates. *Nature Energy*, 2(17110). Doi: 10.1038/nenergy.2017.110.

[20] California Center for Sustainable Energy. 2012. California Plug-in Electric Vehicle Owner Survey. Available at: https://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/California%20Plug-in%20Electric%20Vehicle%20Owner%20Survey%20Report-July%202012.pdf. Accessed: February 2019.

[21] California Center for Sustainable Energy. 2013. California Plug-in Electric Vehicle Driver Survey Results. Available at: https://energycenter.org/sites/default/files/docs/nav/transportation/cvrp/survey-results/California_Plug-in_Electric_Vehicle_Driver_Survey_Results-May_2013.pdf. Accessed: February 2019.

[22] U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy. Electric Vehicle Basics. Available at: https://www.energy.gov/eere/electricvehicles/electric-vehicle-basics. Accessed: February 2019.

[23] Bay Area Census. Contra Costa County. Available at: http://www.bayareacensus.ca.gov/counties/ContraCostaCounty.htm. Accessed: February 2019.

74% of residents in Contra Costa County was less than 60 minutes. These commute times are likely within the 80 to 100 mile range.[24]

A survey conducted by the Union of Concerned Scientists (UCS)[25] found that 64 percent of respondents live in a household with two or more vehicles. This is consistent with a survey of EV users, which reported that 79.4 percent of EV owners and potential owners had two or more vehicles in the household.[26] Conventional wisdom as well as economic theory suggest that when households have at least one EV and one internal combustion engine vehicle (ICEV), they favor the EV and use the more costly-to-drive ICEV for longer distance trips on the weekend, for hauling, or if there is a need for more than five passengers.[27] One detailed study found exactly this in a broad survey of different types of households that have EVs. For example, one-car households that switch from one ICEV to one EV showed very little difference in daily driving distances nor the number of daily trips taken when they invested in an EV.[28] But the households that had one (or more) EV and at least one ICEV all showed that after three months of EV ownership, the daily distance driven for the ICE declined, and the EV increased so that the EV usage was about 45 percent higher in use.

Accordingly, as EV penetration increases, the amount of miles driven for residential trips by EV compared to conventional vehicles will grow at a disproportionately higher rate because households with EVs will tend to rely on the EV for a large majority of their trips.

In summary, there are several two main assumptions included in the Magee Preserve project:

- Electric Vehicle Penetration: Based on the discussion above, a variety of factors will contribute to high rates of electric vehicle penetration near Magee Preserve. First, there are already dozens of electric vehicle models available for purchase in California, and the costs of batteries continue to decrease. Second, there are numerous statewide and regional initiatives to help fund electric vehicle and infrastructure purchases, and many policy goals aim to increase the number of EVs because vehicle electrification is critical to achieving California's long-term greenhouse gas reduction goals. Third, reliable access to EV chargers is an important factor contributing to buying electric vehicles. Therefore, the Project's mitigation measures requiring that EV charging infrastructure be made widely available will encourage EV ownership and use. Given the market trends, policy goals, and infrastructure growth and incentives, this analysis estimates that half the single family residential units facilitated by the Project will have an EV by 2023.
- Electrical Vehicle Usage Rate: As explained above, even though many households with EVs also own a conventional gasoline or diesel car, they use the EV for over 85 percent of work commute,

[24] United States Census Bureau. Travel Time to Work. 2017 American Community Survey 1-Year Supplemental Estimates with a Population Threshold of 20,000 or More Available at: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_17_SPL_K200802&prodType=table. Accessed February 2019.

[25] Union of Concerned Scientists, 2013, Electric Vehicle Survey Methodology and Assumptions; American Driving Habits, Vehicle Needs, and Attitudes toward Electric Vehicles, December. Available at: http://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean_vehicles/UCS-and-CU-Electric-Vehicle-Survey-Methodology.pdf. Accessed: February 2019.

[26] Shahan, Zachary, 2015, Electric Cars: What Early Adopters and First Followers Want. Important Media. Available at: http://cleantechnica.us2.list-manage.com/subscribe?u=a897522b53d0853c85abbf9fa&id=a264ba3c49. Accessed: February 2019.

[27] Union of Concerned Scientists, 2013, Electric Vehicle Survey Methodology and Assumptions; American Driving Habits, Vehicle Needs, and Attitudes toward Electric Vehicles, December. Available at: http://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean_vehicles/UCS-and-CU-Electric-Vehicle-Survey-Methodology.pdf. Accessed: February 2019.

[28] Hwang, Sang-kyu, and Sang-hoon Son, 2015. Electric Vehicle User Mobility Analysis with Dashboard Camera in Jeju Island, Korea. Paper presented at Electric Vehicle Symposium, EVS28, in Kintex, Korea, May 3-6, 2015.

personal errands, and shopping, while the conventional vehicle is the primary vehicle for vacation travel. Therefore, the evidence indicates that households with an EV will have a very high usage rate for residential trips, even if the households also own a conventional vehicle. This analysis conservatively assumes that the EV is only used for 50 percent of trips.

Based on the commitment to install EV chargers in all dwelling units, the subsidy for EV purchase, published peer reviewed studies regarding EV usage behavior and EV adoption trends, and the state's ongoing effort to encourage EV adoption, it is anticipated that up to half of the dwelling units in the Project will have an EV and that they will preferentially drive the EV. As discussed above, studies have shown that households tend to preferentially use the EV. Numerous other factors (e.g., declining costs of EVs) are also anticipated to push the number of EV's used by Project residents to be even higher than that estimated here. Thus, the overall effect of this mitigation measure is estimated to displace 25 percent of the miles driven from residential land uses from traditional gasoline/diesel vehicles with electric vehicles.

This factor is reached by assuming 50 percent of single family residential units facilitated by the Project will have an EV and that 50 percent of trips will be with the EV (50 percent * 50 percent = 25 percent of the total vehicle miles travelled). As discussed above, the specific penetration rate of EVs in new developments that offer in-home charging is rapidly changing and is difficult to assess. However, the assumption of the usage rate of EVs is potentially overconservative, as up to 85 percent of trips per household are driven in the EV based on survey data. Therefore, it is important to note that the total vehicle miles travelled factor could be achieved using different assumptions; for example, 35 percent of homes may have an EV and 70 percent of household trips in those homes would be with the EV, which would also result in 25 percent of total vehicles miles travelled would be with an EV (35 percent * 70 percent = 25 percent).

If you have any questions or need further information, please contact us at your convenience.

Sincerely,

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