



AC PROPULSION INC.

Dedicated to Creating Electric Vehicles that People Want to Drive

www.acpropulsion.com

October 3, 2008

Commissioner James D. Boyd
Commissioner Karen Douglas
Michael Smith
Peter Ward
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

DOCKET

08-ALT-1

DATE Oct. 06 2008

RECD. Oct. 06 2008

Re: Comments on the AB118 Investment Plan (Docket No. 08-ALT-1)

Dear Commissioners and CEC staff:

We appreciate the opportunity to provide the following comments regarding our technology and the draft AB 118 Investment Plan. AC Propulsion Inc. is a California Corporation founded in 1992 to develop, manufacture, and license system and component technology for electric vehicle drive systems. Since its founding, AC Propulsion (ACP) has emerged as a worldwide leader in producing EVs that meet the functional requirements of daily use. AC Propulsion provides drive and control systems for major OEMs, and has developed sophisticated battery management and monitoring systems that extend battery range and operating life.

Milestones include the AC150 Drive System in 1994, which set the bar for performance, the 2nd Generation AC150 in 2000, which is capable of bi-directional grid interface, and the eBox conversion in 2006, also bi-directional charge capable and available to the public.

Key Recommendations Regarding AB 118 Investment Plan

ACP wants to stress the importance of making AB 118 funding available to support Vehicle-to-Grid programs, aftermarket conversions of electric vehicles, and the removal of market barriers that inhibit the innovation and deployment of electric vehicles. Vehicles featuring electric drivetrain technology present some of the greatest opportunities to provide personal transportation with the smallest-possible environmental footprint. However, as with most new technologies, these vehicles have higher near-term costs. AB 118 can be instrumental in reducing these costs.

Funding Support for Vehicle-to-Grid (V2G) Projects

AB 118 funding in support of research, development, demonstration, and deployment of large-scale vehicle-to-grid projects will help prove and refine V2G's ability to create significant additional economic value for EVs. V2G technology can help address intermittency of renewable power, offer important grid stabilization benefits, improve overall grid efficiency,

improve life-cycle CO2 emissions, and provide emergency power supply. V2G can be an effective component of the state's efforts to achieve its petroleum-reduction and climate change goals.

Electric vehicles, as with other personal vehicles, are driven on average for only an hour a day, and are otherwise idle the rest of the time. Unlike other vehicles, though, their ability to integrate with the power grid in a mutually beneficial way could generate an economic value to help offset the ownership costs of such vehicles. The dual use of EVs for clean transportation and grid power support with some form of shared capital cost or chargeback offset could encourage the earlier adoption of EVs.

In addition, studies of the potential for vehicle-to-grid services have concluded that grid regulation is well suited to electric vehicles. Regulation is a means for the operator of the power grid to continuously make small adjustments to the power generated in the system to achieve the needed balance between generation and load, thereby improving overall grid efficiency. Other important benefits of V2G are increased use of wind resources and diurnal storage for intermittent renewables.

Funding Support for Electric Vehicle Conversions

Funding for deployment of after-market electric vehicle conversions, both via demonstration projects and especially direct-to-consumer incentives, will accelerate adoption of climate friendly EV technologies. It will also increase pressure on major energy and auto companies to perform and compete.

ACP's eBox conversion is a full function EV with excellent performance characteristics and is available for purchase today. Based on, and converted from, the Scion xB platform, the eBox has a driving range of 120-150 miles, acceleration from 0-60 in less than 7 seconds, and a top speed of 95 mph. Charge time is 30 minutes for 20-50 miles and 2 hours for a full charge. AB 118 funding could accelerate deployment of EVs like the eBox by offering direct-to-consumer incentives and buy-downs for after-market conversions. Small technology companies such as ACP are well positioned to accelerate innovation and deployment of vehicles by offering real, viable EV products to consumers, and competition with the major OEMs.

Funding Support for Barrier Removal

Removing barriers to entry for small, advanced vehicle technology companies is critically important and will enable direct competition with major OEMs and accelerate commercialization of desirable technologies.

Particularly for small vehicle technology companies and after-market EV conversions, difficulties with warranties and insurance can be a barrier to deployment and eventual commercialization. AB 118 funds could be used to create and fund programs such as advanced technology warranty and/or replacement insurance pools.

AB 118 and Draft Investment Plan Context

Both the AB 118 statutory language, as well as the draft Investment Plan, provide context and direct rationale for support of V2G and EV conversions with AB 118 funds. Specifically, AB 118 statute is clear about supporting V2G projects by stating that eligible projects will include, "projects to decrease the overall impact of an alternative and renewable fuel's life-cycle carbon footprint and increase sustainability" and "projects to develop and improve light-, medium-, and heavy-duty vehicle technologies ... including propulsion systems, ... control systems and system integration, physical measurement and metering systems and software, ... electronic and electrified components, ... plug-in hybrid technology."

In addition, statute is clear about supporting conversions by stating that eligible projects will include, "conversions of hybrid technology to plug-in technology" and "projects that accelerate the commercialization of vehicles and alternative and renewable fuels including buy-down programs through near-market and market-path deployments, advanced technology warranty or replacement insurance, development of market niches, and supply-chain development." *We cannot stress enough the importance of AB 118 funding support for EV conversions as a means to accelerate deployment and prove the viability of low-GHG electric drive technologies.*

Elements of the draft Investment Plan as presented by CEC staff supports the case for funding of electric drive technologies. In the gap analysis presented by TIAX it is clear that electric vehicles receive significantly less funding at all levels than other technologies and fuels, especially biofuels. The TIAX Gap Analysis concludes, "Judging by the ratio of public to private investment, electric drive vehicles appear to offer the highest leverage sector for spurring investment in new vehicle technologies." The CEC staff presentation also importantly notes that electric vehicles have the greatest potential to help California meet its climate change goals as EVs have the highest projected avoided GHG emissions in 2022 at 6.7 million metric tons/yr according to the State Alternative Fuels Plan.

We agree strongly with the recommended actions related to electric drive presented in the TIAX Gap Analysis presentation, namely, "Funding should be spent in relation to viability, environmental performance/sustainability, and potential to meet total demand and GHG reduction goals." Electric drive and battery EVs in particular, have the potential to deliver the greatest reductions in GHG emissions in the 2020 and 2050 timeframes, according to the State Alternative Fuels Plan. We also strongly agree with the recommended action of evaluating grid impacts and benefits, demonstrating vehicles and infrastructure, including smart metering and off-peak charging, and we would specifically call out the importance of vehicle-to-grid and vehicle-to-home applications for study and funding for the reasons stated previously.

Finally, in reaching out to stakeholders, we recommend that CEC staff/TIAX reach out to industry, especially small technology companies, such as ours, whose innovation and progress can significantly accelerate meeting 2020 and 2050 climate goals.

Key Messages Regarding AB 118 Investment Plan:

- Support for small, advanced vehicle and clean fuel technology companies will **leverage innovation, increase competition, and accelerate deployment** of solutions that will enable California to **more quickly** meet its **climate goals** and other environmental standards.
- Support for small, California-based, advanced vehicle and clean fuel technology companies will help **spur job growth, economic development and sector leadership** in California.
- Funding for deployment of **after-market electric vehicle conversions**, both via demonstration projects and especially **direct-to-consumer incentives**, will accelerate adoption of GHG-friendly technologies and will increase pressure on major energy and auto companies to perform and compete.
- Funding for research, development, and demonstration of **large scale vehicle-to-grid projects** will help prove and refine V2G's ability to create significant additional **economic value for EVs** from shared capital cost or chargeback, **address intermittency** of renewable power, offer important **grid regulation benefits**, improve overall **grid efficiency**, and provide **emergency power supply**.
- **Removing barriers** to entry for small, advanced vehicle technology companies is critically important and will **enable direct competition** with major OEMs and **accelerate commercialization** of desirable technologies. Example: Creating and funding technology warranty and/or replacement insurance pools, as called for in AB 118 statute.
- We strongly agree with the recommended action presented in the TIAX Gap Analysis of **evaluating grid impacts and benefits**, demonstrating vehicles and infrastructure, **including smart metering and off-peak charging**, and we would specifically call out the importance of vehicle-to-grid and vehicle-to-home applications for study and funding for the reasons stated previously.

Thank you for your consideration of these comments. Please don't hesitate to contact us for further discussion of any of these points. We hope to be able to schedule a time in the near future to provide a technology briefing and vehicle demonstration for CEC staff.

Best regards,



Tom Gage, CEO