How Could a California Green Bank Help Accelerate Decarbonization?
Opportunities in Transportation

Contributing roughly 40 percent of California's GHG emissions, the transportation sector is well understood as California's biggest clean-energy challenge.[1] To date, existing green banks have included alternative fuels and fueling infrastructure in funding eligibility rules, but have not made the transportation sector a major focus. However, there are several promising ways in which a California green bank could provide unique opportunities and support for California's efforts decarbonize the transportation sector.

Potential Opportunities for Green Bank Interventions

We outline promising opportunities—identified through interviews with transportation experts—that a green bank could provide finance and risk-bearing mechanisms across four transportation subsectors: passenger vehicles, alternative fuel vehicle infrastructure, goods movement, and regional planning. Low-carbon fuels will play a critical role in state GHG reductions; however, to date, we have not identified fuel-related green bank opportunities that would outperform alternative available mechanisms.

This document serves to illustrate the types of transportation-specific interventions possible under the three categories of interventions we have identified as key green bank functions across the economy:

1. Help more individuals easily and affordably finance low-carbon technologies (e.g., financing zero-emission vehicles, such as electric vehicles)
2. Help businesses and public entities get low-cost private financing to reduce emissions (e.g., help small fleets of truck drivers finance more efficient trucks.)
3. Support the scale-up of innovative low-carbon technologies, infrastructure, and practices (e.g., the deployment of alternative fueling infrastructure, and VMT reduction practices.)

Final determination of the transportation-specific opportunities for green bank purview would require further assessment to quantify—in light of current policies— each opportunity's potential GHG impact, cost-effectiveness, and distributional effects.

Passenger vehicles: Expand access to cost-saving vehicles

Passenger vehicles emitted roughly 71 percent of California's annual transportation GHG emissions between 2000 and 2011 – that's 27 percent of California's total annual GHG emissions.[1]

Auto loans for low-carbon vehicles could be restructured to reflect lower fuel costs. High upfront costs of zero-emissions vehicles (ZEVs, including electric vehicles) thwart many customers, especially lower income households, from taking advantage of the fuel-savings offered by low-carbon vehicles. Yet, low-income households typically spend a larger share of income on fuel[2] and stand to benefit more from fuel-saving cars. Most auto loan interest rates do not currently account for the impact of fuel-savings on lowered default risk.[3]

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[1] California Air Resources GHG Inventory 2000–2011. Assessed 12/16/13. http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-

[2] See Burtraw, Sweeney and Walls (2009) The Incidence of U.S. Climate Policy. RFF Discussion Paper; Grainger and Kolstad (2010) Who Pays a Price on Carbon? The NBER Working Paper Series.

[3] One notable exception to this is the Green Auto Loan Discount available through US Bank on EPA certified SmartWay vehicles: https://www.usbank.com/loans-lines/auto-loans/green-auto-loan-rate-discount.html

Financiers are likely hesitant to lower interest rates or change lending criteria based on future fuel savings due to lack of data on actual loan performance.

- ***A green bank could offer credit enhancements to financiers to expand private lending for low-carbon vehicles***. Targeted insurance or other forms of credit enhancement for financiers would enable them to extend loans to more creditworthy Californians and those with lower incomes. A successful credit enhancement program would attract more private capital for low-carbon vehicles, expand availability of consumer financing on the market, and accelerate deployment of EVs and other ZEVs in California. This intervention could also accelerate market viability for ZEV infrastructure investment.

ZEV infrastructure: Flexible financing & risk allocation across public & private sectors

Vehicle electrification and adoption of other alternative fuel vehicles face a well-recognized chicken-and-egg challenge: EVs and other ZEVs will not be widely adopted until charging and fueling infrastructure is available, and charging and fueling infrastructure will not generate acceptable returns on investment without more ZEVs on the road.[4]

EV infrastructure financing and market development requires shared risk and investment between power providers, transportation planners, auto manufacturers, telecommunication companies, regulatory bodies, and state and federal highway agencies. However, EV infrastructure demand is not yet sufficient to attract a significant amount of private capital, and traditional federal and state funds for transportation infrastructure are typically mandated to go towards maintaining the existing road and mass transit network rather than low-carbon fueling infrastructure.

- **A Green Bank could uniquely coordinate EV infrastructure risk and financing across many players to provide financing support flexibly.**[5] This flexible support is needed to spur deployment and market development and to provide the data needed to establish the strong business case for future private financing—i.e. to build a business case for financing underserved markets. For example, a bank could spur market development of profitable home charging stations for multi-family units. It could also support charging station projects that may require longer payback periods or different delayed repayment options than the private market offers at this early stage in the EV market. A green bank could also offer a more flexible pool of financing to state, regional, and local transportation agencies to develop innovative EV infrastructure without foregoing necessary maintenance of pavement, traffic lights, etc.

- **A Green Bank could also provide the financing coordination for the concurrent deployment of distributed solar, energy storage, and smart EV charging needed for vehicle-grid-integration** (VGI).[6] With VGI, EV batteries could serve as a source of grid storage, potentially providing savings to ratepayers and utilities and covering vehicle owners' upfront EV battery costs.

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[4] In his, 2013 ZEV Action Plan, Governor Brown includes existing policies and planned actions to get early alternative fuel infrastructure in place, as well as opportunities to utilize private investment to develop it.

[5] CT's green bank can fund alternative vehicle infrastructure; NY's green bank will likely have similar authority.

[6] California ISO recently released a roadmap of how increased EV use (per Gov. Brown's ZEV mandate) could benefit the grid: http://www.caiso.com/Documents/Vehicle-GridIntegrationRoadmap.pdf

Goods movement: Finance at-scale innovative infrastructure & expand small business access to cost-savings

Little financing is available for at-scale and disruptive innovation of infrastructure and technology for goods movement. Financial support for bold, innovative ideas to decarbonize our freight infrastructure– from electrifying truck-lanes to developing novel modes of freight movement– falls between state and federal jurisdictions. History tells us that the private investment in such infrastructure innovation is unlikely without significant government intervention.

- **A Green Bank could support scale-up of innovative goods movement infrastructure through long-term loans, public investment, loan guarantees, or insurance products.** With a broad portfolio of financing and risk-bearing mechanisms, the bank could flexibly coordinate public and private sector stakeholders to mitigate risks and maximize the chance for success.

California's heavy-duty trucking companies are largely locally-owned small businesses [7] and typically lack adequate access to financing to upgrade their trucks with low-carbon technologies. Heavy-duty vehicles emit approximately 20 percent of California's transportation emissions—8% of total state emissions.[8] The owner-operators of the most carbon-intensive trucks—port hostlers and drayage trucks— and typically are most limited in their access to financing for upgrades. Federal and California do have programs to help small business owners finance cleaner trucks,[9] but barriers still exist to their adoption of more efficient technologies.[10] Loans that incorporate lower fuel costs in loan terms could help owner-operators finance upgrades and new trucks.

- **Again, a Green Bank could offer credit enhancements to financiers to expand private lending to owner-operators for low-carbon upgrades or replacements of heavy-duty vehicles**. (See above passenger vehicle discussion for full rationale.)

Regional planning: lower risk for development of low-carbon transit areas

Metropolitan Planning Organizations may not have access to adequate finance for innovative emissions-lowering transit projects—especially innovations with limited data or precedent to provide to financiers. Targeted and coordinated public investment could enhance the effectiveness of California's 2008 Sustainable Communities and Climate Protection Act (S.B. 375), which requires that Metropolitan Planning Organizations create Sustainable Communities Strategies to meet regional GHG targets for transportation and land-use.[11]

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[7] California Department of Transportation, Commercial Vehicles Factsheet (2012): http://www.dot.ca.gov/hq/tpp/offices/ogm/fact_sheets/Fast_Freight_Facts_Trucks_bk_040612.pdf

[8] California Air Resources GHG Inventory 2000 – 2011. Assessed 12/16/13. http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-

[9] Examples include California's Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) administered by CARB and CALSTART, and the U.S. EPA SmartWay Innovative Financing program.

[10] See Roeth et al. (2013) Barriers to the Increased Adoption of Fuel Efficiency Technologies in the North American On-Road Freight Sector.

[11] California Air Resource Board's "Cap and Trade Auction Proceeds Investment Plan," prioritizes sustainable communities and clean transportation and recognizes that current funding is insufficient to meet existing demand and to support large-

- A **Green Bank could help expand GHG-reducing car share opportunities to more California cities, including underserved communities and suburbs, while increasing ZEV-use and infrastructure**. A green bank could provide financing for pilot car share programs to demonstrate VMT reductions potential. This could include expanding car share programs to suburban and other commuter communities as well as pilot programs for the multi-modal zero emission vehicles (e.g., e-bikes and e-scooters) which have seen success in Asian and European cities. Similarly, a bank could spur larger point-to-point car share pilot programs (e.g., Paris Autolib program) which may require financing support to overcome longer payback periods.

- **A Green Bank could help capitalize projects that enable the fruition of region-wide reductions in vehicle miles traveled.** For example, a green bank could support a reduction in the number of parking spaces—one method employed to lower vehicle miles traveled[12] —and offer insurance products to take on some of the risk that businesses face from reduced parking spaces. A number of schemes that price parking to reduce VMT already exist and any green bank solution should build on existing success stories.[13]

Selecting the optimal green bank intervention opportunities

To meet any long-term goals of decarbonizing transportation, California will need a coordinated portfolio of effective policy solutions. When weighing specific transportation opportunities offered by green bank finance and risk-bearing mechanisms, lawmakers should carefully consider robust analysis to determine if the mechanisms are:

1) needed or redundant, especially in light of existing policies
2) the most effective tool in meeting policy goals
3) cost-efficient, especially compared with other policy tools
4) balanced and equitable impacts across businesses, households, and other stakeholders

California's climate goal of reaching 1990 emissions levels by 2020 may well be the start of a multi-decade commitment to decarbonizing the state economy. Reaching future, more ambitious targets requires careful consideration of all possible innovative approaches today, especially in the transportation sector, where so many possibilities to decrease GHG emissions exist.

Contributors

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scale deployment of alternative technologies: http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/final_investment_plan.pdf

[12] Bedsworth et al. (2011) Driving Change: Reducing Vehicle Miles Traveled in California. Public Policy of California.

[13] Ibid.