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Zero-emission Vehicles and Retail Innovation in the U.S. Automotive Sector: The Consumer Purchase Experience and Dealer Engagement

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Abstract

Innovative new products like plug-in electric vehicles may need new approaches to market and sell them. We conducted 43 interviews with automakers and dealers selling plug-in vehicles in California's major metro markets and analyzed data on customer satisfaction with new car dealers and Tesla retail stores. Our initial findings revealed:

- Plug-in vehicle buyers rated the dealer purchase experience much lower than conventional vehicle buyers while Tesla earned industry-high scores;
- Plug-in vehicles returned higher dealer gross profits but may insufficiently compensate for greater demands, including the provision of support services beyond traditional offerings;
- Public incentives could better align with established dealer practices and business drivers to improve program effectiveness.

We consider how pre-existing retail configurations and arms-length manufacturer-dealer relations in the traditional franchised model could both enable and hinder retail innovations for PEVs. The paper considers implications and opportunities for policy.

INTRODUCTION

While automakers shoulder the burden of compliance with California's Zero Emission Vehicle (ZEV) Program, franchise laws require that the state's 1,292 independently owned and operated franchised dealers sell vehicles to end customers [1, 2]. Although automakers have made PEVs available for purchase by private consumers in California since late 2010, only a minority of dealers in core PEV markets currently offer them. An April 2014 *Consumer Reports* investigation found many dealers knew little about the PEVs they sold, and in some cases outright discouraged PEV purchases [3]. Moreover, dealer groups have moved to block start-up EV automaker Tesla from selling its flagship Model S direct to consumers. Limited engagement by dealers, poor purchase experience, or efforts to block retail innovations in the automotive sector could adversely impact sales and slow the growth of the nascent PEV market.

The California Governor's Office has called on state agencies to "encourage and support auto dealers to increase sales and leases of ZEVs" [4], yet policymakers have little understanding of dealer practices, or how they might support increased ZEV sales vis-à-vis dealerships. Policies do not account for these potentially key players, and little available data exists that describes the extent to which new car dealers are embracing PEVs, or that examine the quality of the purchase experience witnessed by PEV buyers. Following a brief background on the retail landscape serving the automotive sector, the paper presents findings from data on the divergent quality of the purchase experience observed by plug-in and conventional vehicle buyers, discusses observations from dozens of interviews with dealers and automakers, and consider implications and opportunities for policy.

Emergence of the Franchised Dealership Model

As early as the 1930's, automakers divested direct sales to customers in favor of a franchised distribution system in which automakers sell vehicles to independently owned dealers, who in turn sell them to customers. This model better afforded automakers the ability to balance production capacity in a mature market with unstable demand [5, 6]. Traditional franchises typically occupy highly regulated spaces and, in the automotive sector include a large body of stipulations governing licensing for new car sales, employee health and safety, and a variety of consumer protections that vary from state to state. Dealers must make substantial investments in facilities, personnel, vehicle and parts inventories, and service equipment. In return, automakers grant dealers exclusivity to sell its product within a given market area [5, 6]. Dealers add value for manufacturers as a source of highly localized market information, and facilitate thousands of unique and highly complex transactions, including trade-ins. Dealers add value for customers by providing warranty coverage, repair parts, and localized service and maintenance for the vehicles they sell [5].

Though ostensibly partners, automaker-dealer relations are fraught by a long history of mistrust arising from inequality in bargaining power. Dealers depend entirely on the automaker for supply of its product, creating dependency relations that automakers sometimes exploited to its advantage. Federal and state regulations emerged to protect dealers from unfair practices such as termination of franchise agreements without cause or forcing unwanted inventory on dealers [6]. By 2002, every U.S. state had passed franchise laws governing commercial relations between car dealers and auto manufacturers [7]. Though they vary from state to state, franchise laws typically stipulate that automakers with existing franchise dealer networks must continue to sell all new vehicles through these outlets. This effectively bans direct sale of vehicles by incumbent manufacturers. Also, as independently owned and operated businesses, *new car dealers individually decide which vehicles they sell and how they are retailed to customers*. Automakers are limited to more indirect means for influencing the purchase experience and can include providing dealers with informed recommendations and financial incentives, including offsets for marketing costs, facility improvements, training, or other investments deemed appropriate by automakers.

Existing Retail Approaches May be Ill-suited for Radical Technologies

This unique franchise industry structure is potentially significant because, as GM CEO Mary Barra recently stated to an audience at the Detroit Economic Club, "Technology advancements are revolutionizing the auto industry." So much so, according to Barra, that "This industry will experience more dramatic change in the next decade than it has in the past 50 years." She specifically cites new propulsion systems and alternative fuel sources as key catalysts of this change [8].

For the most part, previous automotive advances that addressed social externalities such as air pollution represented continuous improvements to core vehicle systems. These incremental technical advances had little impact on customers, and therefore on how a the product was marketed and sold. Some examples include catalytic converters, anti-lock brakes, and air bags.

Unlike the more gradual or "continuous" improvements in vehicle systems that came before, "discontinuous innovations" are marked by fundamental shifts in one or more systems that call for substantive changes not only in the underlying technical knowledge base, but also in the way that customers interact with the product. PEVs and fuel cell vehicles represent a substantial departure from at least one core vehicle system (the engine and powertrain) and engage customers in new behaviors such as charging with electricity from the power grid instead of fueling with gasoline [9]. They also bring entirely new experiences such as the convenience of fueling (charging) at home. Away from home, customers rely to varying degrees on new supporting infrastructure – public charging stations involving new equipment that operates and behaves differently than gas pumps (it takes far longer than 5 minutes to "fill the tank", for example).

But discontinuous technical advances of this sort can have discontinuous market impacts in that they alter current modes of behavior or require completely new or a highly modified set of complementary products to support them [10]. Changes of this more sweeping nature have not been witnessed since the formative years of the automotive industry nearly a century ago. Such departures may entail not only new engineering capabilities by firms, but also new strategies and competencies to market and sell them [11]. The paper examines *how well existing retail structures are delivering PEVs to market* and considers opportunities for policy.

Distributed Agency Complicates PEV Commercialization

The success of discontinuous innovations often rests on a value proposition that is distinct from earlier offerings. The "value proposition", defined by the business literature as 'the value created for users by a product offering based on technology' [12], may improve upon the existing feature set, appeal to a customer's value or belief system, or introduce altogether new sources of value to customers. In the case of PEVs, the technology offers the potential to improve facets of vehicle performance like acceleration and handling, along with dramatic increases in fuel economy. It appeals to environmentally minded customers, as well as those supporting oil independence. It also offers at-home 'fueling', an entirely new convenience. Public incentives may confer additional benefits such as tax breaks, purchase rebates, and carpool lane access. The more the cumulative value of these benefits offsets the incremental costs incurred to the customer, the greater the likelihood of market acceptance.

Innovations of this nature, however, can invoke uncertainty in core attributes of product performance that can deter prospective buyers from making the jump to the new technology. Early digital cameras, for example, lacked the high resolution desired by amateur and professional photographers but appealed to the "point and shoot" customer for its superior portability. By comparison, PEVs may appeal to similarly distinct customer segments that may be willing to accept some uncertainty or diminished performance in core vehicle attributes (e.g. fuel economy, range, and refuel times) in return for benefits. As a far more expensive purchase, however, new car buyers may look to retailers for support when weighing options.

A substantial body of literature establishes the effect early customers have on subsequent adopters is conditioned by learning derived from experience with the technology; good experiences promote diffusion while bad experiences delay it [13, 14]. The marketing literature for new products (i.e. goods and services) suggests that when firms introduce substantially new discontinuous products, there is often a gap between the promised value proposition to the customer and the ability of the product to fulfill that promise [10]. Closing the gap between the promised and realized value for customers – especially when attempting to move beyond more fault-tolerant early adopters to the more practical early majority customer segment – entails the provision of a number of supporting products and services [10]. These may entail changes in how products are brought to market, or call for entirely new business models.

But developing and commercializing innovative new products is rarely the domain of a single entity or "agent". Rather, responsibility is distributed amongst multiple agents, and the path to market is conditioned by pre-existing organizational arrangements and patterns of relations in a product's value chain [15]. The nature of these arrangements can vary from loosely coupled 'arms-length' interactions to closer, more integrated vertical relationships. This path-dependency [16] influences how new products are delivered and received in the marketplace. Further, where agents are not readily substitutable there is a degree of mutual dependency amongst them; a firm cannot introduce an innovation without the coordinated participation of the others. Hence, the actions (or inaction) of one can constrain the will of the other. But constraint, dependency, and power do not necessarily preclude

cooperative relations amongst agents. Rather, innovations can challenge and alter existing patterns of provision, with innovation 'both arising from, and contributing to, the pattern of distributed activities' [15].

Methods

The relative newness of policy research on the subject of new car dealers and environmental innovations means that testable hypotheses are largely unavailable for study. The intent of the research is to begin laying the groundwork for such hypotheses. The study invokes grounded theory to explore factors influencing dealer engagement in PEV sales, as well as retail practices that could affect the quality of the PEV purchase experience. We use a novel mixed methods approach [NEED CITATION] in which we examine the "buy" side of the PEV purchase experience through available data while collecting information on the "sell" side of the purchase transaction to capture retail-level drivers affecting dealer engagement in PEV sales. This approach inherently provides some convergent validity for the research by seeking information on a topic area from multiple sources. Incorporating qualitative interview data also provides a "bottom up" approach to building theory and testable hypotheses related to a problem where little information is currently available [17]. Three primary methodologies and sources of information are used:

1. Consumer New Car Sales Satisfaction Survey Data (J.D. Power)

We analyzed national and state-level buyer index scores from J.D. Power 2013 Sales Satisfaction Index (SSI) study data on customer satisfaction with new car dealerships and Tesla retail outlets. The SSI study is a national random sample survey of new car buyers that measures customer satisfaction with the retail purchase experience [18]. J.D. Power's syndicated SSI study is used to gauge and benchmark the performance of new car dealers across the industry. It includes responses from 29,040 owners of new model-year 2012 through 2014 private use vehicles bought (or leased) and registered between April and May of 2013, representing a 13.5% response rate.

The Sales Satisfaction Index is derived from a weighted composite of ratings from both new car buyers and buyers who shopped a particular dealer but purchased elsewhere (aka "rejecters"). Since J.D. Power collects data at the make (brand) level rather than at the model level, it was not possible to determine whether a 'rejecter' spurned a conventional gas vehicle or a PEV (with the exception of Tesla). Hence, The findings presented here are based on J.D. Power's Buyer Index Scores only. Rejecter data, had we been able to include it, would lower the scores. Thus, our findings represent a conservative estimate of customer satisfaction with the new vehicle purchase experience. The buyer index score of the SSI survey assesses four distinct phases and 17 attributes of the car buying process and assigns a weighted index score [18]. The data set also included buyer demographic information as well as "Power Information Network" (PIN) data capturing dealer-level business financials such as transaction prices and dealer gross profits.

The study captures 12 different PEV models from eight vehicle manufacturers, but did not include start-ups CODA and Fisker, nor did it include models introduced after the study period. California data for Tesla Motors was unavailable as Tesla opted out of IHS/Polk data collection on which the SSI study is based. We further adjusted the SSI data by weighting it to the 2013 US sales mix of PEVs.

2. California PEV Buyer Survey Data (Clean Vehicle Rebate Program)

We additionally collected data specific to the PEV purchase experience from survey questions co-developed with the Center for Sustainable Energy (CSE) and incorporated in the PEV Demographic and Diffusion questionnaire. CSE administers the survey to PEV rebate applicants as part of the state's Clean Vehicle Rebate Program (CVRP). All PEV buyers who submit a rebate application are invited via email to participate in a 45-minute online survey that collects a variety of data on buyer demographics, purchase intentions, and other aspects of the PEV purchase transaction. A small subset of co-developed questions elicited opinions about the retail purchase experience and gathered feedback on how well retailers met the unique needs of PEV buyers.

Question development was informed by conversations with early PEV buyers and dealers offering PEVs from major metro areas in Northern and Southern California. Given the early state of PEV sales, access to PEV buyers was limited. We used a combination of criteria (attendees must have purchased a PEV in the previous six months) and convenience sampling (area customers reached through Electric Vehicle Association contacts) to select participants for the consumer focus group. Observations were drawn from 11 owners and lessees of various PEV makes and models. All interviews were conducted in July of 2013. Participants shared experiences shopping and purchasing a new PEV and expressed ideas for improving the customer purchase experience. Based on this feedback, we posited

that PEV buyer perceptions of salesperson expertise may be related to how well informed dealers are on topics that extend beyond the vehicle itself to a breadth of topics that include support services specific to the differentiated needs of PEV buyers.

The question subset explored PEV-specific product knowledge and support services for home and away charging, local electricity rates, and public incentives, as well as overall satisfaction with the purchase experience. CSE estimates the survey reaches approximately 70 percent of the state's PEV buyers. Over 7,000 responses were collected between October 2013 and January 2014, representing a response rate of 17 percent. It was not possible to weight the data for sales mix, however. Hence, the data may be biased toward less affluent respondents and may over-sample and under-sample specific PEV makes and models. Consequently, we treat the data as suggestive, rather than representative of the statewide population of PEV buyers.

3. Interviews with New Car Dealerships and Automakers

A third approach used in the research involved interviews with dealer principals (owners or general managers) and sales staff sampled from a cross-section of new car dealerships and retail stores in California's major PEV markets. These included the Bay Area and the greater Sacramento, Los Angeles, and San Diego regions. Sampling was intended to cover the range of dealer attributes (size, location, ownership structure) and influences that might impact dealer participation in, and success with, PEV sales. This included dealers in metro and suburban areas with at least six months of experience selling plug-in hybrid and/or full battery electric vehicles. Whenever possible, the researchers selected dealers representing a specific make or makes for a given area in the top quartile of PEV sales, and one dealer representing the same make(s) outside this top quartile but selling at least ten units monthly.

In most cases interviews were conducted by two researchers; two for each interview. Whenever possible, interviewers took in-person meetings with the owner or general manager at the dealer facility, followed separately by a member of the sales team. Interviews were semi-structured to allow both interviewer and interviewee to explore topics that might emerge organically during the conversation. Interviews typically lasted between one to two hours, and were guided by a set of specific topic areas: the interviewee's history with the dealership and sales, motivations for selling PEVs, investments and requirements for doing so, attitudes toward new technologies, and perceptions about barriers, opportunities, and incentive programs for PEVs. Interviews were typically followed by a tour of the dealer's facility. Photographs and other marketing collateral were also collected.

The interview team met during and after the interview period to discuss preliminary themes and to consider whether questions should be eliminated, modified, added, or emphasized. Interview recordings were transcribed and then reviewed by members of the research team, including at least one interviewer. Each compiled a summary which was then compared across dealers and automakers to surface initial themes representing common ideas, experiences, and perceptions across interviews [19]. To identify themes in the data, the research team conducted a three-step coding process that included open (or semantic) coding on the first reading to surface and assign initial codes, axial (or thematic) coding to review and examine initial codes, and selective coding to locate illustrative examples of identified themes [19, 20]. Observations are drawn from a total of 43 interviews, including five from OEM representatives with specialized knowledge in marketing and retail strategy for advanced vehicles, and 38 dealer interviews from 20 retail site visits.

Findings

PEV Buyers Rate Satisfaction with Dealers Substantially Lower

We examined 2013 SSI data to determine whether differences existed in the quality of the purchase experience observed by PEV buyers relative to conventional vehicle buyers. To address concerns that PEV buyers expect more of dealers due to the predominantly higher socio-economic status of early adopters, we included only those responses reporting an annual household income of $100,000 or more and at least a college level education. Figure 1 presents buyer ratings of the overall retail experience based on market segment and powertrain. We found that on average, *plug-in vehicle buyers rated dealers much lower in sales satisfaction than conventional vehicle buyers*. In contrast, buyers ranked Tesla much more favorably.

The magnitude of these disparities is extraordinary by industry standards, even for new technologies, suggesting the problem is likely systemic. Within each phase, the results reveal large across-the-board deficits on specific facets of

the purchase experience. Tesla's industry-high marks suggest new retail approaches could lift satisfaction scores, engendering positive word of mouth that could hasten consumer adoption.

PEVs also attract customers new to the brand (i.e. 'conquest' customers) at a higher rate than conventional vehicles (55 percent versus 49 percent for non-premium makes), but only 21 percent of PEV buyers indicated they would "definitely" purchase from the same dealer as compared to 35 percent of conventional vehicle buyers. Similarly, only 20 percent of PEV buyers stated they would "definitely" buy from the same make again, compared to 32 percent of conventional vehicle buyers nationally.

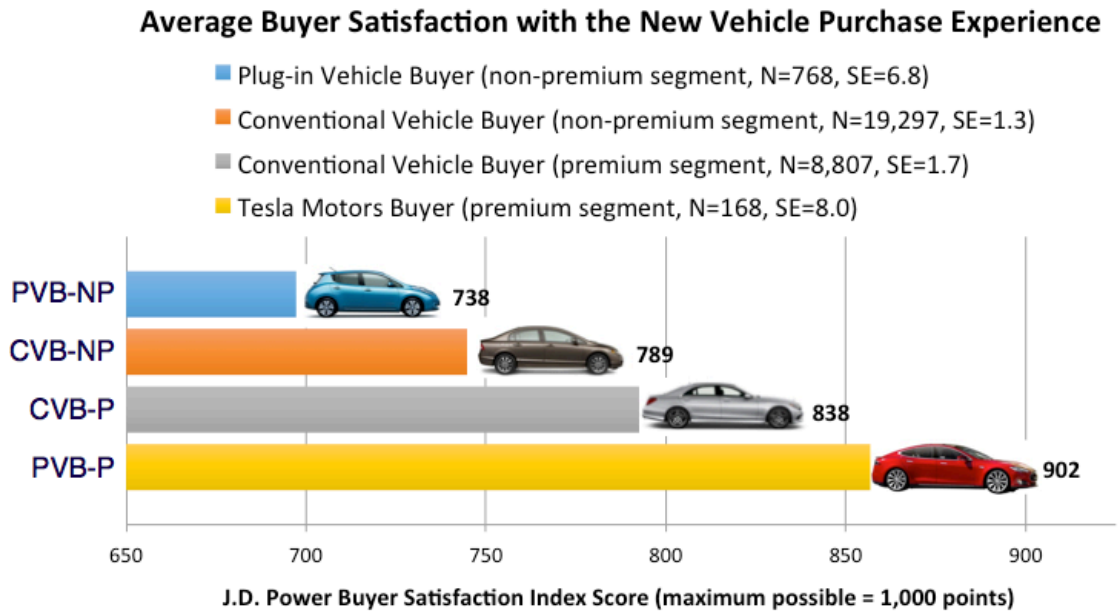

FIGURE 1 Average ratings of overall buyer satisfaction with the new vehicle purchase experience [21]

PEVs Create Greater Burdens for Dealers

The single largest deficit in the 2013 SSI data centered on the salesperson's product knowledge. Additional evidence from the state rebate survey suggests that PEV buyers expect sales staff to grasp a much broader set of topics, many of which extend beyond traditional knowledge areas to include charging infrastructure, electricity rates, and public incentives. It also suggests that PEV buyers expect dealers to offer a broader level of support for needs specific to the technology. Figure 2 reveals that only a small proportion of California dealers currently offer support activities valued by PEV buyers such as assistance preparing applications for public incentives, selecting a home charger and/or arranging for its installation, and enrollment in 'away from home' charging networks.

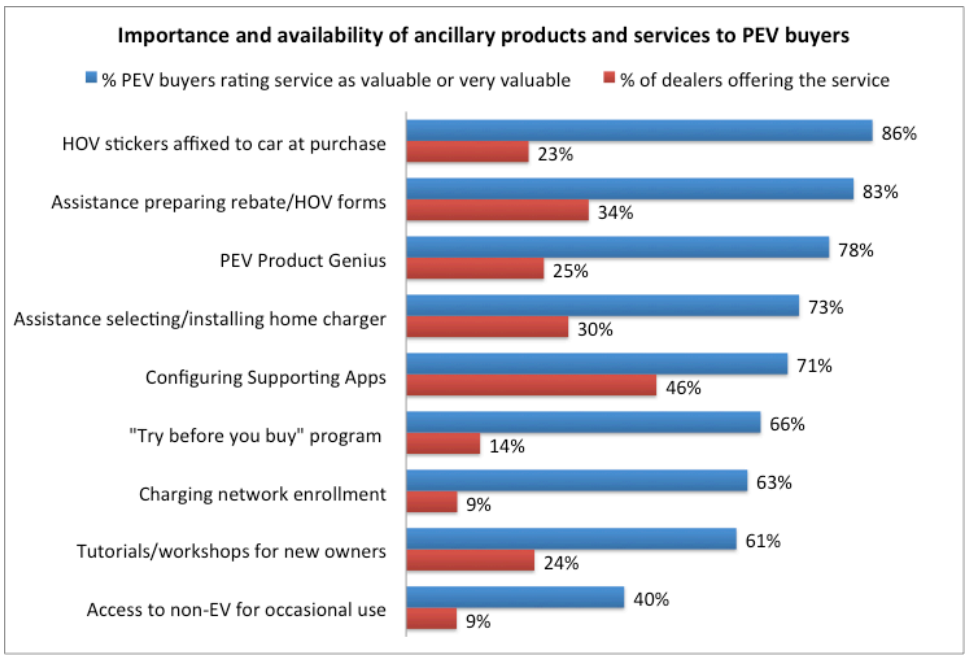

FIGURE 2 Percent of plug-in vehicle buyers indicating certain support products and services for PEVs were "valuable" or "very valuable" compared to the percent of PEV dealers that offered these products and services [22]

Traditional training and certification methods may inadequately equip sales staff to sell more complex PEV technologies. Sales staff contend with an ever-growing amount of technology content amongst a broad array of product lines across multiple makes and models, each with unique "trim" levels that may contain a variety of evolving technologies from hands-free telematics devices to sophisticated driver-assist features. Plug-in technologies can be substantially more complex, involving new equipment, infrastructure, and adjustments in consumer behavior.

Complicating matters further is the fact that much of this knowledge rests on information that varies from customer to customer. For example, a customer's electric rate can vary substantially between utility districts, and actual savings for one household may be different from another. Individual air districts and municipalities may offer incentives as well. Moreover, eligibility for all or a portion of the federal tax credit is based on the customer's tax liability, which is often unknowable until tax time. Dealer training by automakers is short on these specifics. Instead, dealers are pointed to a variety of online resources to determine market or customer-specific incentives at the state, regional and local levels. Because consumer protection laws expose dealers to legal liability for communicating misleading information to customers, dealers face a choice: use carefully worded qualifying statements when discussing these topics (e.g. by referring customers to their individual accountants for guidance) or eschew mention of these incentives altogether. Worse yet, some automakers specifically advise dealers to avoid mentioning them. Many simply refer customers to other sources for guidance, leaving questions that could otherwise solidify a PEV sale unanswered.

Further, where PEVs may represent a small portion of dealer sales or where initial demand for PEVs is low, retention and recall of PEV-specific information becomes challenging. Dealers emphasized that salesperson competence, as well as salesperson confidence with new technologies, is a by-product of hands-on learning achieved through regular exposure and repetition that builds on previous success. As one dealer aptly stated, "A salesperson is never more confident about selling a car then the day he sold one". Weak initial demand, or demand that is shared across a pool of sales representatives, translates into fewer interactions for individual sales personnel, undermining repetition and retention of PEV-specific information. Extraordinarily high employee turnover in the new car business, running upwards of 50% or more annually for some dealerships, further erodes learning and retention.

Dealers also claim that PEVs involve a much longer 'sales process' than conventional vehicles. The sales process refers to the point of first contact with the customer to the final closing of the sale. Dealers described PEV customers as particularly discriminating, requiring more time from sales staff, not only to learn the technology and related incentives, but also to generate leads, field questions, and cultivate relationships that result in a sale. From a salesperson's perspective, this additional time represents a cost of doing business that detracts from time spent closing another potentially more lucrative transaction.

Dealers similarly report that PEVs involve longer transaction times, defined as the total time spent at the retail location from the point at which the customer arrives at the dealership to the point they drive off with a new car. But the 2013 SSI data revealed that total transaction times at dealerships for PVBs average 4 hours and 11 minutes, slightly less than the industry average for CVBs at 4 hours and 19 minutes. Dealers similarly reported a much longer delivery process for PVBs – anywhere from 10 minutes to twice as long as conventional vehicles. Again, the data counters this perception. The average duration of the delivery process for non-premium PVBs was fractionally longer at 33 minutes, compared to 32 minutes for CVBs (41 minutes for premium CVBs). In contrast, Tesla buyers on average spent just 2 hours and 23 minutes at the retail location, but with a delivery process nearly twice as long at just over an hour (61 minutes). Much of the reduction in the overall transaction time is due to Tesla's online fixed-price retail model, which eliminates lengthy price negotiations, slashes the time to complete paperwork, and obviates associated wait times at the physical storefront.

PEV Profits Not Compelling Enough to Engage Dealers

Dealers are in business to maximize profits from selling (including financing), servicing, and repairing new and used automobiles. The foremost variable influencing the decision to offer PEVs is profitability. Dealers lump profits into two categories. "Front-end" profits refer to dealer revenues from the sale of the vehicle itself. This is reflected by the difference between the sale price and the dealer's cost, typically the "invoice" price minus moneys returned to the dealer by the factory upon sale (e.g. dealer "holdback", advertising reimbursements, and flooring assistance). Most dealers reported marginal gains, and in many cases, losses, on the "front-end" sales of PEVs. Dealers also earn profits on the "back-end" of a vehicle sale. This is typically generated from financing, leasing, or the sale of optional upgrades and products. Even in terms of back-end profits, dealers expressed few opportunities from PEV sales.

PIN data, however, revealed that dealer gross profits, defined as the dealer's total proceeds (which includes factory reimbursements) on the sale, minus the dealer's costs, vary widely by PEV make/model. In most cases, (7 out of 10 models over the study period), gross profits were higher for individual PEV models than the average for conventional models in the same size category (i.e. compact and midsize vehicles). Two of the PEV models with lower profits, however, were amongst the most popular vehicles sold. This could be the result of oversupply relative to the demand for these vehicles.

Several additional factors may contribute to the perception that PEVs are money-losers. First, the SSI data revealed that 61 percent of California PEV buyers leased versus 22% of conventional car buyers [21], often to the most creditworthy and informed of customers, leaving little opportunity for dealer reserve (profit on the spread between the bank rate and the rate charged to the customer). Second, according to dealers selling full battery EVs, a greater proportion of customers purchase them as second vehicles, resulting in fewer trade-ins, an increasingly valued source of more lucrative used car revenue. Dealers do report leveraging PEV sales to earn monthly volume-based factory bonuses, often by selling them at reduced prices, a common industry-wide practice for all vehicles.

For sales staff, traditional commission structures may inadequately compensate for the added burden associated with PEV sales. Closing a sale on a vehicle with little or no front-end profit earns a salesperson a small, flat rate bonus called the "mini" between $150 and $200, an unattractive sum compared to other more lucrative vehicles. To encourage more sales staff to sell PEVs, many OEMs offer dealer sales staff a modest fixed, per-unit bonus (aka a "spiff") or a variable bonus (aka a "spin").

A number of other factors likely affect PEV profitability and dealer perceptions. Loss of pricing power with widening Internet use and a shift in customer preferences toward smaller, less expensive platforms has eroded new car profits industry-wide. Due to technical and cost constraints, most automakers have packaged plug-in powertrains into midsize and smaller vehicle categories, which traditionally carry lower profits than larger SUV and truck platforms. Dealers also expressed concern that PEVs have so far resulted in fewer warranty repair and service and

maintenance opportunities than conventional vehicles. Consequently, as a category, PEVs may not represent a compelling investment to many dealers.

Technology, Environmental Leadership Draw Dealers to Sell PEVs

Given the added burdens and questionable profitability of PEVs, what motivates dealers to sell them? Observations from leading PEV dealers, i.e. those in the top quartile of sales in a given region, offer some insight. Unsurprisingly, geographic location and other endowments play a significant role. Proximity to higher educated, more affluent customers and transit corridors with HOV lane access means these dealers are amongst the first offered the chance to sell PEVs. But other attributes may be equally important. Near universally, sales staff referred to one or more dealer principals as champions of PEVs, providing top-down leadership and ensuring support for PEV sales across the organization. Many of these "pioneer" PEV dealers acknowledge the challenge of near-term profitability, but most embrace technology at large, see increasing vehicle electrification as a long-term industry trend, and view PEVs as a long-term investment. They further see PEVs as an extension of existing brand positioning targeted at increasingly technology-savvy and environmentally aware customers. A number of dealers, for example, touted solar-equipped facilities and/or LEED certification. Through brand association, these dealers aim to use PEVs as part of a larger strategy to win new customers from competing vehicle manufacturers and dealers, thereby expanding market share.

"Pioneer" PEV Dealers Spearhead New Approaches to Sell PEVs

We found that retailers serve a number of key functions important for PEV sales: (1) ensuring the product matches the customer's driving profile, (2) articulating the unique value and relative advantage of PEVs, and (3) enabling the customer to realize the promised value proposition through ongoing support before, during, and after purchase. Many of these activities are not new to dealers; rather, they appear to take on added importance for PEVs.

Leading, or pioneer, PEV dealers fold these technologies into existing operations but also introduce new approaches to cater to the specific needs of PEV buyers. Examples include marketing carpool-lane stickers, enrolling buyers in charging networks, and preparing incentive paperwork for customers. Some dealers assign seasoned salespeople as PEV experts, many of whom drive plug-ins themselves—to learn the ins and outs of the technology and relate the car's benefits to potential buyers. These sales specialists underscored that living with a PEV accelerates and deepens learning, and is particularly helpful for developing and honing effective language for conveying the unique value proposition of PEVs to customers. For example, dealers learned that expressing vehicle pricing in terms of total monthly cost, factoring in savings from public incentives, fueling costs, and reduced commute times, was particularly effective with PEV buyers.

A number of facilities featured PEVs prominently in the showroom and on dealer lots, co-located with complementary equipment such as Level 2 chargers and/or solar canopies. Some PEVs wore HOV lane access decals. One dealer noted that these steps serve as great "conversation starters", regardless of whether the customer arrived intending to buy a plug-in vehicle. Also important, according to these dealers, is the maintenance of sufficient inventory to ensure popular PEVs and trim lines are available to begin with.

Other steps included dedicating real estate for PEV models on the dealer website, with links to supporting PEV-related products and services. PEV specialists cited online forums as a robust source of information for dealers, especially for emergent problems and potential fixes, often well ahead of formal notifications from the factory. The forums also provide an opportunity for dealers to answer questions, inform customers, and steer prospective buyers to the dealership. Finally, some dealers employ targeted online marketing techniques that key on common keywords and search phrases to reach PEV customers and attract them to the dealership.

We encountered many examples of grassroots outreach to sell PEVs. Examples include leveraging local EV users groups to facilitate ride and drive events at high-traffic areas like community fairs and festivals. Some dealers have proactively pursued leads at local employers, particularly technology companies with large corporate campuses, pairing these efforts with preferred pricing packages. Finally, PEV sales people often develop their own collateral for customers, providing PEV-specific information and links for additional after-sale support and assistance. These sales people also make a point of following up with customers at regular intervals.

Implications of Retail Structure and Institutional Barriers For Industry

While the pioneering efforts of some franchise dealers show they can be an invaluable source of innovation for growing PEV sales, the question remains, *how should automakers spread these and other lessons to less motivated dealers*?

Laws that govern the sales of automobiles may not be well suited for introducing radically different technologies to customers. Automakers would like more say over how innovative new products like PEVs are sold, but power in the franchised model is highly decentralized. Automakers with established dealer networks are bound by franchise laws to sell all new cars through licensed, fully independent dealers who make their own decisions about which cars they sell and how they are sold. Moreover, these agreements vary according to the unique franchise laws and consumer protections governing each state. This translates into divergent processes – and hence very different experiences for customers – across the dealer community at large.

Even if automakers and dealers devised an ideal retail experience for PEV shoppers, these laws would bar them from implementing it across the entirety of the retail network. For example, Sonic and AutoNation, two of the nation's largest dealer groups, are experimenting with an entirely new buying experience that features no-haggle pricing and leverages technology to dramatically streamline the car buying experience in ways that could benefit PEV buyers even more, namely by giving sales people the tools needed (such as customer-specific incentive information) to better support PEV customers. But Sonic sells only a small fraction of the new cars sold nationwide, and automakers cannot dictate that others implement similar practices.

These laws also confer little automaker discretion over which dealers offer PEVs. Automakers can and do establish threshold criteria for dealer participation in PEV sales. Required equipment and training for sales and service staff, for example, can cost dealers anywhere from $10,000 to $100,000, depending on manufacturer-specific requirements and other variables. But these must be justifiably "reasonable" to avoid contest by dealers. In most states, once a manufacturer makes a new product available to one or more dealers, franchise laws require them to offer them to all dealers within a fixed period, typically six months. Such rules beg the need for automakers – and dealers – to adroitly develop new competencies that can be shared across broader segments of the dealer base. Yet the added burdens, and marginal profits of PEVs (as for many new vehicles), may not be compelling enough to drive other dealers to copy them. Also compelling automakers to reach more dealers is the need to achieve the scale to drive down the initial high cost of these cleaner alternatives.

Opportunities for Policy

Limited dealer engagement, and lower retail performance, may adversely impact PEV sales and the growth of the nascent plug-in vehicle market through missed opportunities to attract and retain customers to the technology. To address these challenges, a two-fold policy approach may be needed: One that both *relaxes restrictions* that block the diffusion of new retail approaches, and that *aligns incentives* with how cars are actually sold.

Legislators, for example, could ease constraints by granting manufacturers a special exemption from overly restrictive rules and regulations, capped at some set number of PEVs sold. This could give automakers the degree of control, and space from legal complications, to work out kinks with dealers and early customers, develop scalable processes for introducing PEVs to mass-market customers, and ensure that effective dealer performance standards are in place before handing the reins over to wholly independent retailers.

Government could better aid dealers in other respects. Currently, customers must wait weeks or even months to receive the state's PEV rebate. Pulling it to the point of purchase, for example, by giving dealers the opportunity to reserve the funds in advance (as was done with the decals that permit single-occupant access to carpool lanes), would enable dealers to market them confidently without fear of unwanted liability. Customers would also gain certainty in receiving the full value of the benefit, reinforcing the program's efficacy [23]. To address the large gap in product knowledge by dealers, government could pool incentive information into a single central database that could be tapped by online apps for PEV retailers. Selling PEVs does involve extra legwork for dealers, at least initially. But for those that adopt effective practices, governments could allocate a portion of the consumer PEV rebate to dealers and salespeople to reward efforts and motivate additional PEV sales.

Future Research

The findings presented here surfaced a number of potential hypotheses that could be tested through additional research. Examples include the degree to which a mix of additional support services for PEV customers or new training approaches result in higher sales satisfaction scores and/or increased PEV sales. It would also be advantageous to compare the purchase experience of PEV versus conventional buyers at the dealership (rather than the make) level. Additionally, a longitudinal study of survey data would also be useful for determining whether automakers and dealers are making progress toward closing the gap in retail performance for PEVs. Yet another avenue for future research could broaden the examination of retail-level influences on PEV market development to include the role of other intermediaries and supporting entities like electric utilities, charging network operators, and NGOs. This initial exploration provides a springboard for these potential works.

Conclusion

How PEVs are sold can be just as important as how well they are designed. The evidence establishes that the PEV purchase experience is well below par from industry norms, that product knowledge is sorely lacking, and that support for technology-specific needs is not being met. These may not only cost manufacturers and dealers repeat customers, but could undermine consumer perception of plug-in vehicle technology more widely. Dealers are an important part of the equation for achieving goals aimed at reducing oil use, air pollution, and greenhouse gas emissions. Accounting for these key players through more "retail friendly" policy could bolster the effectiveness of incentive programs. Addressing industry structure, including restrictions that prevent the wider spread of retail innovations, should be a top concern of policymakers.

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