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New Car Dealers and Retail Innovation in California's Plug-In Electric Vehicle Market

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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 stores. 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 gross profits but place greater demands on dealers, including the provision of support services beyond traditional offerings;
- New retail approaches undertaken by 'dealer innovators', including new methods for building and scaling dealer competence, could improve the PEV buying experience; and
- Public incentives could better align with established dealer practices and business drivers to improve program effectiveness.

Evidence suggests that pre-existing retail configurations and arms-length relations in the traditional franchised dealer model could both enable and hinder retail innovations for PEVs, as well as the quality and pace of diffusion amongst dealers and customers. The paper examines the implications of these findings for policy.

INTRODUCTION

Plug-in Electric Vehicles (PEVs) represent a substantial leap forward in technology that entail not only new engineering capabilities by firms (e.g. high-voltage electrical and mechatronic systems and interfaces), but also new strategies and competencies to market and sell them [1]. This is especially true where substantial shifts in consumer behavior are required [2].

In response to California's Zero Emission Vehicle mandate, automakers have recently begun introducing plug-in electric vehicles in volume to the state's 1.7 million annual new car buyers. While automakers shoulder the burden of compliance with California's Zero Emission Vehicle (ZEV) Program, franchise laws require the state's 1,292 independently owned and operated dealers sell vehicles to end customers [3, 4]. Dealers individually decide which vehicles they sell and how they are retailed to customers. The California Governor's Office has called on state agencies to "encourage and support auto dealers to increase sales and leases of ZEVs" [5], yet policymakers have little understanding of dealer practices, or how they might support increased ZEV sales vis-à-vis dealerships.

Presently, 19 different models of PEVs from 10 different manufacturers are available for purchase in California, but only three of these models are available nationally. 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. Further, the quality of the purchase experience has come under scrutiny. An April 2014 *Consumer Reports* investigation, in which it dispatched 19 mystery shoppers to 85 dealers across four states, found many dealers knew little about the PEVs they sold. In some cases, dealers outright discouraged PEV purchases [6]. In a number of states, dealer groups have moved to block start-up EV automaker Tesla from introducing its direct-to-consumer retail model. Limited engagement by dealers, poor purchase experience, or efforts to block innovations in the automotive retail sector could adversely impact sales and slow the growth of the nascent PEV market.

Policies and incentive programs do not currently account for the key role dealers play in new vehicle transactions. There is also little available information 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. Data is needed to compare the purchase experience for plug-in and conventional vehicle buyers and consider whether differences may impact PEV adoption.

The study addresses three research questions: (1) How does the quality of the retail experience for PEV buyers compare with buyers of conventional vehicles? (2) What retail-level drivers impact PEV sales? And (3), what opportunities exist for policy? In this paper, we present preliminary findings from a study of the retail market for PEVs in which we conducted 43 interviews with six automakers and 20 new car dealers in California's major metro markets for PEVs. The paper aims to provide a background on the existing automotive retail landscape, to present data on the divergent purchase experiences and needs of plug-in vehicle buyers, and to explore drivers that could influence the capacity of established automakers and their dealer networks to deliver retail-level innovations that support PEV sales and PEV market growth.

Distributed Agency and Discontinuous Innovation

Developing and commercializing innovative new products is rarely the domain of a single entity or "agent"; rather, responsibility is typically distributed amongst multiple agents in a product's value chain. In these instances, the path to market is conditioned by pre-existing organizational arrangements and patterns of relations amongst multiple agents [7]. The nature of these arrangements can vary from loosely coupled 'arms-length' interactions to closer, more integrated vertical relationships. This path-dependency [8] influences how new products are delivered and received in the marketplace. Further, where innovation is distributed amongst agents, and 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 other agents. Hence, the actions (or inaction) of one can constrain the will of the other. But constraint, dependency, and power does not necessarily preclude cooperative relations amongst agents. Rather, innovations can challenge and alter existing patterns of provision for new products, with innovation 'both arising from, and contributing to, the pattern of distributed activities' [7, 9].

Unlike routine upgrades of existing products, 'discontinuous innovations' require substantive changes in current modes of behavior, or require completely new or highly modified set of complementary products (e.g. such as

charging infrastructure) to support them [2]. As a discontinuous innovation, PEVs offer a unique value proposition for new car customers. The 'value proposition' of a product is defined by the business literature as 'the value created for users by a product offering based on technology' [10]. For example, PEVs offer the potential to improve elements of vehicle performance (albeit at the cost of shortcomings along well-established performance parameters such as range or refuel times) along with dramatic increases in fuel economy. Public incentives may confer additional benefits such as tax breaks and HOV lane access. This value offsets the incremental costs incurred by the customer, increasing its likelihood of acceptance in the marketplace.

Starting with Rogers [11], a substantial body of literature establishes that early customers play a critical role in technology diffusion. 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 [12]. 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 [2]. Closing the gap between the promised and realized value for customers entails the provision of a number of supporting products and services [2]. These may entail changes to existing modes of provision (e.g. online versus physical store) or entirely new business models. For example, after its products languished on the shelves of big box electronics retailers alongside much cheaper alternatives from PC makers IBM, Hewlett Packard, and Compaq, computer giant Apple re-invented its retail business model, branding itself as a digital services company. It then unveiled both factory-owned retail stores and a virtual 'Apple store' with a constellation of offerings to support a series of ground-breaking new products like the iPod, iPhone, and iPad that fundamentally transformed the user experience.

Retail Innovation and the Franchised Dealership Model

Established automakers are introducing PEVs through the same established retail channels that have supported customers of conventional vehicle for many decades. As early as the 1930's, manufacturers divested direct sales to customers in favor of the franchised distribution model in which automakers sell vehicles to dealers, who in turn sell them to customers. The franchised dealer model emerged as a way for automakers to balance production capacity against unstable demand in a mature market [13]. Traditional franchises typically occupy highly regulated spaces. In the automotive sector, a large body of stipulations govern 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 product within a "relevant market area" [13], defined as a 10-mile radius around the retail facility. Dealers add value for automakers as a source of highly localized market information. They also facilitate thousands of unique and highly complex transactions, including trade-ins [13]. Dealers add value for customers by providing a wide selection of immediately available models for test drives and purchase. Dealers also provide warranty coverage, repair parts, and localized service and maintenance for the vehicles they sell.

Historically, dealerships have been run by independent small business owners. Though ostensibly partners, automaker-dealer relations are fraught by a long history of mistrust arising from inequality in bargaining power that has continued from the formative years of industry growth to modern day. Dealers depend entirely on the automaker for supply of its product, creating dependency relations that automakers sometimes exploited to its advantage. For example, automakers at one time could terminate, or threaten to terminate, dealer franchise agreements and sometimes pressured dealers for concessions such as taking unwanted vehicles [14]. Federal and state regulations emerged to protect dealers from these practices such that by 2002, every U.S. state had passed franchise laws that govern the commercial relations between car dealers and auto manufacturers [15]. These laws limit the scope and extent of control and influence that automakers can exert on franchise dealers. An arms-length relationship ensued, and best characterizes automaker-dealer relations today.

Though they vary from state to state, franchise laws typically stipulate that automakers with standing franchise dealer networks must continue to sell all new vehicles through these outlets. This effectively bans sales of vehicles through factory-owned stores by incumbent vehicle manufacturers. Also, as independently owned and operated businesses, *new car dealers individually decide which vehicles they sell and how they are retailed to customers*. Without direct control over the retail experience, automakers are limited to more indirect means for influencing dealer behavior. These can include informed recommendations and financial incentives, including offsets for costs such as marketing, facility improvements, training, or other investments the automaker deems helpful for moving branded products.

Methodology

The study invokes grounded theory to explore factors influencing dealer engagement in PEV sales and retail practices that could affect the quality of the PEV purchase experience. We use a novel mixed methods approach to empirically explore retail-level drivers affecting the PEV purchase experience and 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. In total, three primary methodologies and sources of information are used:

1. Consumer New Car Sales Satisfaction Data

We analyzed national and state-level J.D. Power 2013 Sales Satisfaction Index (SSI) study data on customer satisfaction with new car dealerships and Tesla stores. The SSI study is a national random sample survey of new car buyers that measures customer satisfaction with the retail purchase experience [16]. Automakers and dealers commonly use J.D. Power's syndicated SSI studies to gauge and benchmark the performance of new car dealers across the industry. It includes responses from 29,040 owners of new 2012 through 2014 model-year private use vehicles purchased (or leased) and registered between April 1, 2013 and May 31, 2013. 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 [16]. The data set also included buyer demographic data 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, including GM (Chevrolet Volt), Nissan (LEAF), Tesla (Model S), Ford (Focus EV, C-Max Energi and Fusion Energi), Honda (Fit EV and Accord PHEV), Toyota (Prius Plug-in and RAV4 EV), Mitsubishi (i-MiEV), and Daimler (Smart Fortwo ED). The 2013 SSI study did not include start-ups CODA and Fisker, nor did it include models introduced after the 2013 SSI survey period such as the Chevy Spark, Fiat 500e, BMW i3 and i8, or the Cadillac ELR. The SSI study is facilitated by the provision of data by automakers collected by IHS/Polk, an automotive services provider. While Tesla Motors was part of the study, California data was unavailable since Tesla opted out of providing IHS/Polk data in the state of California. We further adjusted the SSI data by weighting it to the 2013 US sales mix of PEVs.

2. California PEV Buyer Data

We additionally examined exploratory data from survey questions co-developed with the Center for Sustainable Energy (CSE) and incorporated in the PEV Demographic and Diffusion questionnaire disseminated to PEV purchase rebate applicants. The survey queries plug-in vehicle buyers who apply for the PEV purchase rebate through the state's Clean Vehicle Rebate Program (CVRP). CSE administers the CVRP program and collects information from rebate applicants. All PEV buyers who submit a rebate application are invited via email to participate in a 45-minute online survey that collects data on buyer demographics, purchase intentions, and other aspects of the PEV purchase transaction.

CSE invited the study team to assist in developing a set of questions eliciting opinions about the retail purchase experience from PEV buyers. To inform questionnaire development, we convened an exploratory focus group of EV enthusiasts who had purchased a PEV in the previous six months. The participants shared their experiences shopping and purchasing a new PEV and work-shopped retail-level improvements they would like to see implemented. The researchers also visited with a handful of local and Bay Area dealerships to conduct informational interviews with dealer owners and principals. These conversations informed development of a set of questions about the buyer's retail purchase experience that CSE incorporated into the existing CVRP survey. The survey is a non-scientific sample of new PEV buyers who opted to complete the CVRP PEV demographics and diffusion survey. We use the survey for exploratory purposes to consider a broader set of factors than those in the SSI survey that may influence PEV buyer behavior.

Questions explored whether customers shopped multiple dealerships or retail storefronts, dealer knowledge of PEV-specific topics such as home and away charging and local electricity rates, importance of PEV-specific support and services, and overall satisfaction with the purchase experience. Based on the exploratory focus group / workshop findings, we considered that for PEV buyers, perceptions of salesperson expertise may be related to the breadth of a salesperson's knowledge associated not just with the vehicle, but with a variety of associated products and support services specific to the differentiated needs of PEV buyers. Over 7,000 responses were collected between October

2013 and January 2014, representing a response rate of 17 percent. These data are preliminary, however, in that they have not yet been appropriately weighted for sales mix.

3. Semi-structured Interviews with New Car Dealers and Automakers

The third and final approach used in this research involved a semi-structured interview process sampled from a cross-section of new car dealerships and retail stores in California's major metro markets for PEVs, including the Bay Area and the greater Sacramento, Los Angeles, and San Diego regions. The goal of the interview sampling was to cover the range of dealer attributes and drivers influencing dealer participation in, and relative success of, PEV sales. The researchers selected dealers representing a cross-section of manufacturers offering PEVs with relatively high (top quartile) and low (at least ten units monthly) PEV sales volume within a given market area. For the purpose of this paper, the study employed a qualitative, interpretive approach to the interview data to inform the analysis of quantitative data and yield insights that might not otherwise be possible from examining quantitative data alone.

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. Interviews were typically followed by a tour of the dealer's facility. Photographs and other 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 [17]. 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 [17, 18]. Observations are drawn from a total of twenty site visits to dealer facilities and 38 interviews conducted with new car dealers and retailers, totaling over 60 hours of recorded audio.

Findings

Plug-in Buyers Rate Dealers Substantially Lower

PEV buyers universally report lower satisfaction with the dealer purchase experience. Figure 1 presents buyer ratings of the retail experience based on market segment and powertrain. To address the argument that PEV buyers expect more of dealers due to predominantly higher socio-economic status, we included only those responses reporting an annual household income of $100,000 or more and at least a college level education. 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 and indicate the problem is likely systemic. Poor purchase experience 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. Within each phase, the results listed in Table 1 reveal large across-the-board deficits on specific facets of the purchase experience, especially salesperson knowledge and expertise about the vehicle (86 points). Tesla's industry-high marks suggest new retail approaches could lift satisfaction scores, engendering positive word of mouth that could hasten consumer adoption.

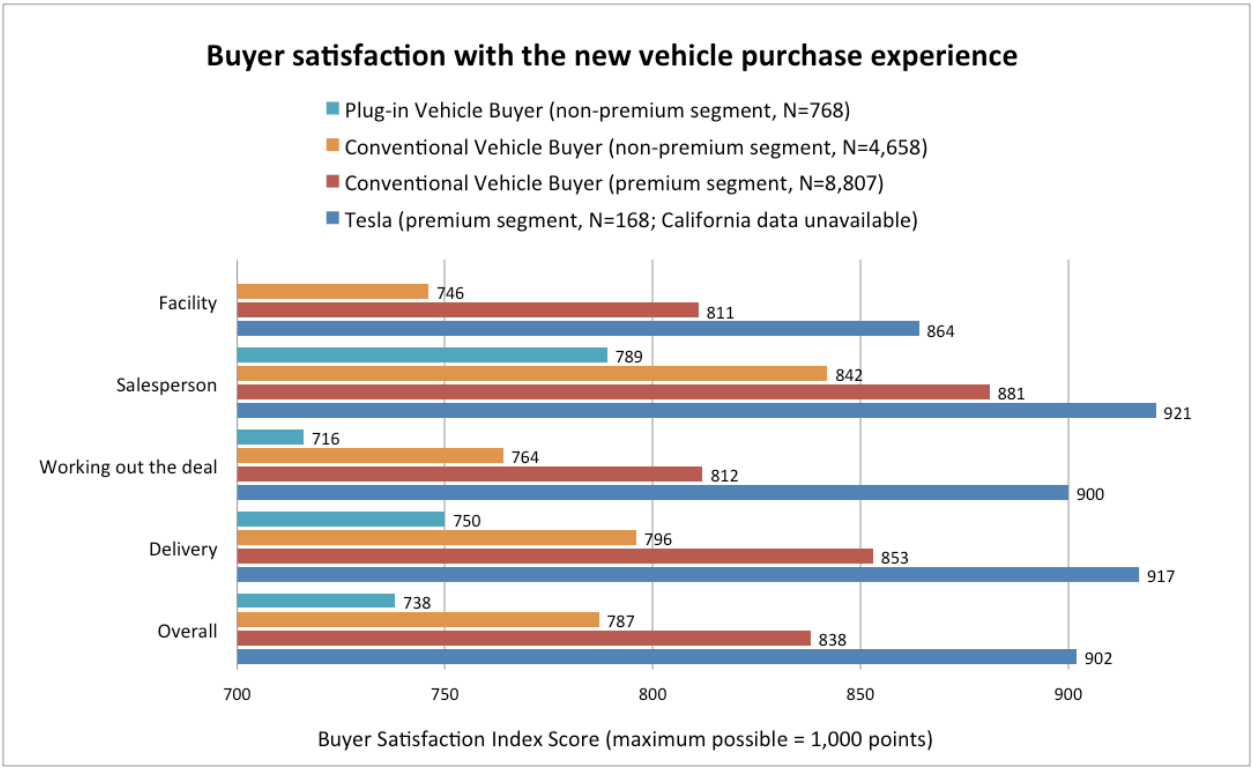

FIGURE 1 Ratings of buyer satisfaction with the new vehicle purchase experience by phase of the purchase process from 2013 SSI buyer index scores [19]

Attribute	Phase	SSI Deficit
Knowledge/expertise about vehicles	Salesperson	86
Variety of Inventory	Facility	83
Ease of looking at inventory	Facility	73
Comfort of the area the vehicle was negotiated for	Facility	71
Appearance of the facility	Facility	66
Clarity explaining documents	The Deal	59
Timeliness of completing the final paperwork process	The Deal	58
Concern you purchased the best vehicle for your needs	Salesperson	55
Timeliness of completing final delivery	Delivery	53
Honesty of the people who handled paperwork	The Deal	52
Thoroughness expalining vehicle features	Delivery	49
Responsiveness	Salesperson	44
Honesty	Salesperson	43
Ease of Coming to agreement on final price	The Deal	42
Condition of vehicle	Delivery	42
Fairness of the price paid	The Deal	39
Courtesy	Salesperson	36

TABLE 1 Deficits in SSI scores (on a 1,000-point scale) of the buying experience assigned by U.S. non-premium PEV buyers as compared to scores assigned by non-premium conventional vehicle buyers [19]

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 vehicles), 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. This evidence suggests customers endured a worse purchase experience, which may not only cost dealers and OEMs repeat customers but could undermine customer perception of plug-in technology.

Dealer Heterogeneity Yields Highly Diverse Purchase Experiences

Standard deviations associated with the scores reported in Figure 1 reveal substantial variability (183 and 162 points respectively for conventional non-premium and premium makes). Plug-in vehicles track slightly higher (188 points for non-premium makes). A number of factors may contribute to the variability in customer experience. The highly decentralized nature of the franchise model, in which contractual arrangements and franchise laws confer a great degree of operating freedom to new car dealers, translates into divergent processes across the dealer community. Franchise laws bar automakers from setting uniform processes for its retail networks. In its place, automakers establish customer satisfaction performance criteria and reward those dealers that meet or exceed these standards. Internal or third-party customer satisfaction surveys such as J.D. Power's SSI study are often used for these purposes. Thus, automakers typically perform quality control through tracking and reporting of customer satisfaction metrics, targeted financial carrots, market information, and other indirect inducements to align dealer behavior with automaker interests.

Franchise laws also constrain automaker discretion over which dealers offer PEVs. Automakers cannot withhold product from some dealers to the exclusion of others. Automakers can and do establish "reasonable" threshold criteria for dealer participation in PEV sales, however, and typically include investments in special equipment and training for sales and service staff amounting to between $10,000 and $100,000 depending on manufacturer-specific requirements and other variables. In most states, franchise laws require automakers to offer new vehicle models and other products to all dealers within a fixed period after initial introduction to one or a limited number of dealers, typically six months. Such rules beg the need to adroitly develop new competencies that can be shared across broader segments of the dealer base.

PEVs Turn Mixed Profits for Dealers

The real or perceived profitability of PEVs relative to conventional vehicles plays a determining role in whether dealers choose to engage in the sale of PEVs. Dealers have witnessed substantial erosion in new car profits over the last decade, in part due to loss of pricing power with widening Internet use and a shift in customer preferences toward smaller, less expensive platforms. Due to technical and cost constraints, automakers have introduced plug-in powertrains almost exclusively in the compact (including subcompact) and midsize vehicle categories. Improvements in vehicle reliability over the past two decades has further drained profits from service and maintenance, another key profit center for dealerships. As one dealer aptly stated, "We've hurt ourselves by making a product that's really, really good." Dealers in our interviews confirmed that PEVs have so far resulted in fewer warranty repair and service and maintenance opportunities than conventional vehicles.

Many dealers reported little or no up-front profit on sales of PEVs (the industry term is 'front end' profit). We investigated these claims by examining 2013 Power Information Network (PIN) data on dealer gross profits, defined as the dealer's total proceeds on a new vehicle sale minus the dealer's costs. Proceeds include any amount held back by the automaker and returned to the dealer upon closing the sale (aka "dealer holdback"). We found gross profits vary widely by PEV make/model and in most cases (7 out of 10 models over the study period) proved higher for PEVs than for the average across conventional models in the equivalent size category (i.e. compact and midsize vehicles). Thus, in terms of gross profit, dealers on average not only *make money* on PEVs, they *make more money than many conventional vehicles*. This is not to say that no dealers lose money on PEVs, only that on average most dealers fair no worse selling PEVs than they do selling conventional vehicles.

Despite higher gross profits, traditional commission structures may inadequately compensate sales staff for the additional 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 deal' or "mini". These are typically in the range of between $150 and $200. Since the vast majority of sales staff earn a living from commissions, these sums are unattractive relative to other more lucrative vehicles. As part of normal practice, many OEMs offer dealer sales staff a fixed, per-unit bonus called a "spiff" or a variable bonus or "spin" to increase the appeal of these vehicles.

Dealers similarly expressed few opportunities for 'back-end' profit on new PEV sales. 'Back end' profit refers to a host of other less direct forms of income from a vehicle sale that can include optional upgrades and products, warranty repairs, mark-up on vehicle financing (aka "dealer reserve"), or revenue from trade-ins. Dealers reported that many PEV buyers, especially buyers of plug-in hybrids, forego purchase of optional charging equipment and those that do yield marginal profits for dealers. Other products such as window-tinting have proven popular for some dealers, yielding an additional $100 to $150 in profits. Since a majority of PEV sales are special leases, often to the most creditworthy and informed of customers, there is little opportunity for dealer reserve. Moreover, dealers selling pure BEVs cite fewer trade-ins, an increasingly valued source of more lucrative used car sales, in part because a greater proportion of customers purchase them as second vehicles. Further, due in part to supply imbalances and/or more rapid price declines for new PEVs relative to new conventional models, resale values of some PEV models have suffered. Consequently, dealers expressed concern that competition from low-priced used PEVs may further erode margins on new PEVs. Lastly, dealers foresee no new revenue streams on the horizon from PEV sales. Dealers do report leveraging PEV sales to earn monthly volume-based bonuses from the automaker, often by selling them at reduced prices. This is a common practice across vehicle categories. Regardless, as a category, PEVs may not represent a compelling investment to many dealers.

PEVs Involve a Longer Sales Process

Adding to apprehensions over the relative profitability of PEVs is concern that PEVs involve a much longer 'sales process' than conventional vehicles. The sales process refers to the point of first salesperson contact with the customer to the final closing of the sale. Dealers described early adopter PEV customers as particularly discriminating, requiring more time from sales staff to answer questions, provide test drives, 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.

As a component of the sales process, the amount of time spent purchasing the vehicle (i.e. 'transaction time') measures the total time a customer spent at the retail location from the point at which the customer walks in to the showroom (or lot) to the point they drive off with a new car. Figure 2 shows that industry average transaction times for conventional vehicles run in excess of four hours. For plug-in vehicle buyers, total transaction times at dealerships average 251 minutes (4 hours and 11 minutes), slightly less than the average for conventional car buyers at 255 minutes (4 hours and 15 minutes). In contrast, Tesla buyers on average spent half as long (at just over two hours) interacting with retail representatives.

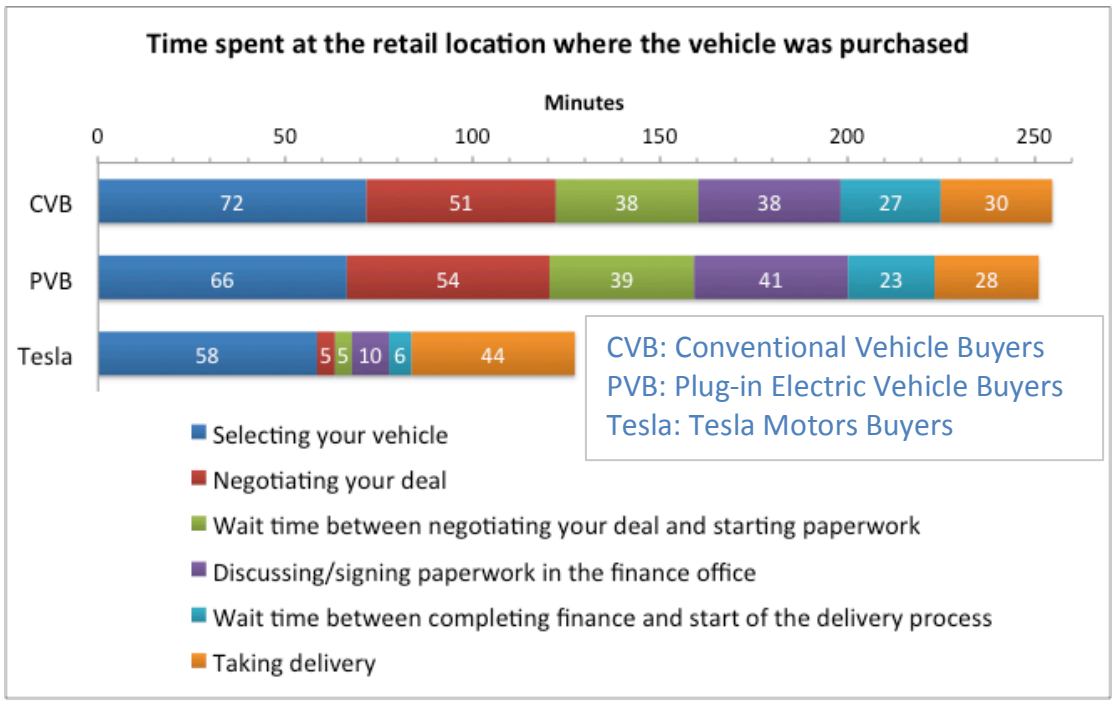

FIGURE 2 Transaction times reported by new car buyers at the retail location where the vehicle was purchased [19].

Figure 2 reveals stark contrasts between the franchised dealer and Tesla experiences. First, Tesla eliminates time-consuming price negotiations and slashes the time spent with the retailer preparing finance paperwork. Wait times associated with these activities witness significant reductions (from over an hour for buyers in the dealer model to 11 minutes for Tesla buyers). Notably, Tesla buyers reported a delivery process 47 percent longer on average (at 44 minutes) than conventional vehicle buyers, and 57 percent longer than plug-in vehicle buyers purchasing via dealerships. In interviews, however, dealers uniformly reported longer delivery times for PEVs, adding anywhere between ten and 30 minutes to typical delivery times. The data presented in Figure 2 contradicts this perception.

PEV Buyers Expect More from Dealers

Additional evidence from the state rebate survey supports the contention that PEV buyers expect more from dealers. Questions derived from insights drawn from an exploratory focus group of PEV buyers and inserted into the CVRP survey attempted to capture considerations unique to PEVs that the SSI study may have overlooked. The findings revealed that many PEV buyers hold higher expectations for dealer knowledge and performance. This included the expectation that sales staff grasp a much broader set of topics that extend beyond traditional knowledge areas to include supporting equipment, charging infrastructure, and public incentives.

Figure 3 below indicates that PEV buyers perceive dealers to be much less knowledgeable than factory store representatives about topics important to them. This may in part explain why the vast majority of California PEV buyers (83 percent) reported being “dissatisfied” or “very dissatisfied” with the dealer purchase experience. Despite this disparity, however, PEV buyers indicated that a majority of dealers had at least some knowledge of these subject areas. Similarly, only a small proportion of California dealers currently offer a set of non-traditional support activities valued by PEV buyers (Figure 4). Examples include assistance preparing incentive applications, selecting a home charger and arranging for its installation, and enrollment in ‘away from home’ charging networks.

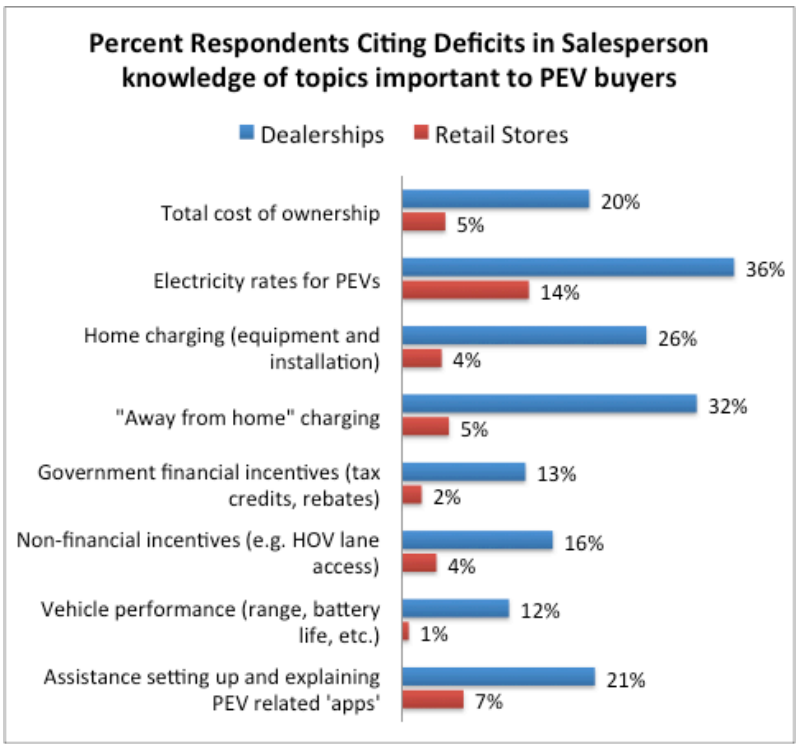

FIGURE 3 Percent of California PEV buyers stating that the PEV retailer was "not at all knowledgeable", "not very knowledgeable", or "unsure" of their knowledge about the topics listed [20].

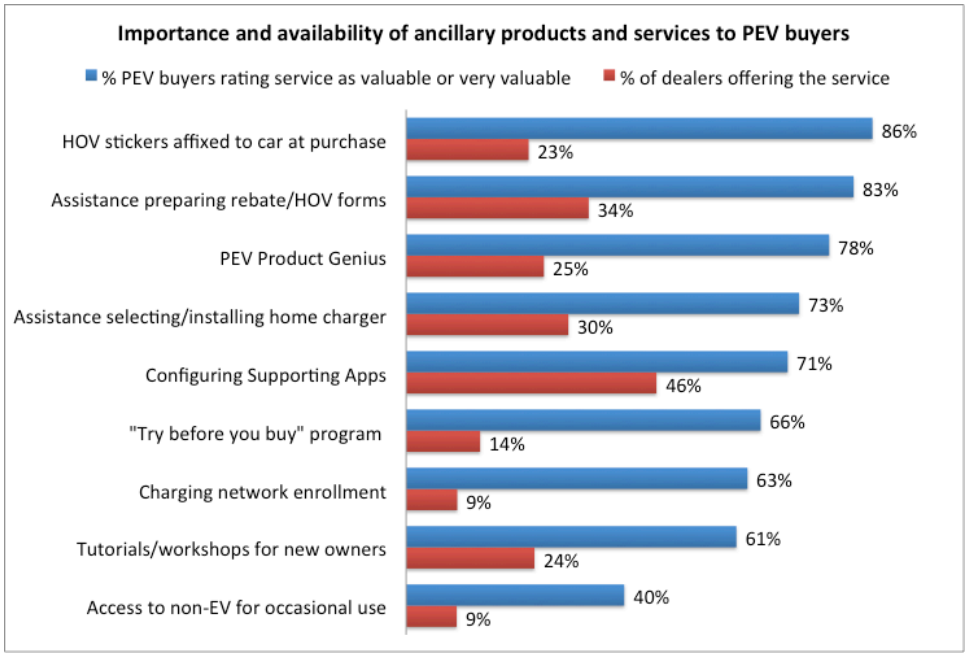

FIGURE 4 Percent of plug-in vehicle buyers indicating certain support products and services for PEVs were, or would be, "valuable" or "very valuable" compared to the percent of dealers that offered these products and services [20].

Thus, for PEV buyers, perceptions of salesperson expertise appear to extend beyond the traditional bounds of vehicle knowledge to an 'ecosystem' of supporting products and services. We surmise these deficits in salesperson knowledge and/or adequate support for all or a portion of the 'product-service ecosystem' contribute to the deficits in PEV buyer satisfaction with the dealer experience.

New Training Approaches May Better Equip Dealers

Traditional training and certification methods 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 products. It is not unusual for dealers to carry multiple brands or "makes". A GM dealer, for example, may carry Chevrolet, Cadillac, Buick, and GMC branded vehicles. Within each make dealers sell multiple "models" or "nameplates". Each model consists of multiple "trim" levels that may contain a variety of evolving technologies from hands-free telematics devices to sophisticated driver-assist and safety systems. Plug-in technologies can be substantially more complex, involving new equipment, infrastructure, and adjustments in consumer behavior. Yet, as a consequence of the automaker's introduction strategy dealers typically sell PEVs alongside these other products. Many incumbent automakers, for example, have initially introduced plug-in powertrains either as stand-alone models on a dedicated platform and badged under the legacy brand (such as the Nissan LEAF and Chevy Volt), or as variants of conventional models (such as Ford's 'Energi' product line introduced in the Fusion and C-Max model lines).

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, is a by-product of hands-on learning achieved through regular exposure and repetition that builds on one success after another. 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 undercuts learning and retention.

Some automakers have taken steps to combat these challenges. All in our study maintain internal websites with PEV-specific training modules available to dealer sales staff that cover such topics as product features, pricing, financing, and incentives. These may include general information about available government incentives and other discounts. Some automakers have instituted hotlines staffed by product experts and reachable by dealer sales staff for answers to PEV-specific questions. Some dealers have similarly taken initiative to overcome barriers to learning.

New Retail Approaches by PEV 'Dealer Innovators'

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 necessarily new to dealers; rather, they take on added importance for PEVs.

We found that particular dealers in certain regions stood out for their innovative efforts to attract and serve PEV customers. Many 'dealer innovators' typically designate one or more seasoned, tech-savvy sales staff – typically holding the title of Internet sales managers or similar – as the PEV specialist or "product genius". These sales people generally have at least two or three years of sales experience behind them. They are knowledgeable and passionate about technology, readily see the potential of vehicle electrification, and will go to great lengths to work through initial hiccups and meet the more burdensome demands of early customers. In many cases, these representatives drive a PEV on a regular basis, either a privately purchased personal vehicle or a demonstrator vehicle (aka "demo car") supplied by the automaker or dealer for test drives, marketing, and other purposes.

Sales representatives underscored the value of full immersion in the 'PEV lifestyle' to their comprehension of the technology and their effectiveness in relating the value of these vehicles to customers. Living with a PEV serves to accelerate and deepen learning, and is particularly helpful for developing and honing effective language for conveying the unique value proposition of PEVs to customers. For example, by discussing vehicle pricing in terms of total monthly cost, factoring in not only savings from lower payments resulting from lease specials and government incentives, but also from savings in gasoline costs, service and maintenance, and reduced commute times. Many facilities featured PEVs prominently in the showroom and on dealer lots. While this is a fairly traditional means for dealers to allocate limited space where demand justifies it, what is different is that these dealers co-located complementary products such as Level 2 chargers and/or solar canopies with PEV models. More recently,

some acquire and affix the HOV lane access decals to vehicles on the lor and/or showroom floor. One dealer touted this technique as a great "conversation starter" regardless of whether the customer came in with the intent to buy a plug-in vehicle.

In addition to novel use of physical space, some leading PEV dealers exercise initiative in the virtual arena as well. Dealers typically maintain an online presence that at minimum lists vehicle inventory and pricing, and possibly descriptions of the store and its staff. PEV dealer innovators go further. Some provide dedicated real estate on the dealer web page for PEV models and links to supporting PEV-related products and services. PEV specialists may participate in online forums and chat-rooms for PEV drivers. These settings often provide a robust source of information for dealers, as participants discuss issues and fixes for various problems that emerge, often well ahead of formal notifications from the factory. The forums also provide an opportunity for dealers to answer questions, inform customers, and ultimately guide prospective buyers to the dealership. Finally, dealers with more robust web-based marketing efforts employ targeted marketing techniques that use common keywords and phrases entered by online car shoppers to reach PEV customers and attract them to the dealership.

PEV dealer innovators further stand apart from their peers by taking initiative in a number of other respects. This can take the form of grassroots outreach by sales staff to local EV user groups who often assist sales people to develop leads through public education and outreach, often at little or no cost to the dealer. Examples include facilitating ride and drive events at high-traffic areas such as community fairs and festivals. Some dealers have proactively pursued leads at local employers, particularly targeting technology companies with large corporate campuses, pairing these efforts with preferred pricing packages negotiated with the automaker. Finally, PEV sales people at a number of these dealerships develop their own collateral with PEV-specific information and links for additional after-sale support and assistance. Many also make a point of following up with customers at regular intervals after the close of a sale. In this way, PEVs offer opportunities for dealers to add value to the purchase experience by serving as a key link between PEV customers the product-service ecosystem they depend on.

"Retail Friendly" Public Incentives could Bolster Program Effectiveness

Not only does effective selling of PEVs appear to entail a broader scope of knowledge by dealers (beyond that required for conventional vehicles), much of this knowledge rests on information that varies from customer to customer. A dealer's primary interest is to close a sale. Anything that introduces uncertainty into the customer's buying calculus reduces the likelihood of that outcome. For example, eligibility for all or a portion of the federal tax credit is based on the customer's tax liability, a consideration that is typically unknowable until tax time. Moreover, consumer protection laws expose dealers to legal liability for communicating misleading information to customers. Consequently, 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 eschewing mention of these incentives altogether. Lease deals obviate this tap dance by allowing dealers to capture the full amount of the credit as a capital cost reduction at the point of purchase, thereby eliminating uncertainty (i.e. risk). Not surprisingly, we found that 61 percent of California PEV buyers favor leasing over other forms of vehicle financing as compared to just 22 percent of the state's conventional vehicle buyers [19].

Much like the federal tax credit, California's state rebate introduces multiple levels of uncertainty and risk into the retail transaction. First, buyers must apply for the rebate *after* completing the purchase. Thus both parties lack full certainty during the purchase transaction. And, because the customer may not receive the rebate check until up to 60 days after vehicle purchase, the full monetary value of the incentive is not captured by the customer (i.e. it is implicitly discounted to some lower value) [21]. Lastly, funding shortfalls have cast doubt on the continuing availability of the state rebate. California's HOV lane green decal program for plug-in hybrids involves similar uncertainties, all of which sap the dealer's ability to tap the full potential of these incentives.

Other incentive-related uncertainties abound. Electric utility rates can vary substantially from one utility district to the next, and even from customer to customer based on a household's individual use profile. Rate discounts for PEV owners vary between districts, if offered at all. Further, individual air districts and municipalities may offer incentives of their own. Residents of counties in the San Joaquin Valley, for example, are eligible for an additional $3,000 rebate for purchase of qualified zero-emission vehicles. Similarly, a state grant program in which PEV buyers received free home charging equipment plus an allowance against installation cost wreaked havoc at dealerships. Why? The program released a fixed amount of chargers on a monthly basis that could only be allocated to a customer with the bill of sale on the day of purchase. The program often quickly ran out of supply and buyers

deliberately delayed purchase until release of the next monthly allotment, overwhelming dealers and interrupting timely service to other customers. Consequently, dealers reported they avoided mention of the program unless raised by the customer.

Even sales people highly motivated to sell PEVs must research these incentives carefully. While OEM-based online training for dealers allude to government incentives for PEVs, they typically point dealers to a variety of online resources to determine market or customer-specific incentives at the state, regional and local levels. Customers, however, can come from any number of locations, compounding the challenge. For example, customers may reside in different utility service territories; one district may offer rate discount for PEV buyers, the other may not. As a consequence of these uncertainties, some dealers choose not to evangelize the benefits of various public incentive programs. Worse yet, some automakers specifically advise dealers to avoid mentioning them at all. Many simply refer customers to other sources for guidance, leaving questions that could otherwise solidify a PEV sale unanswered. Failure to communicate these benefits ultimately undermines the effectiveness of these programs.

Dealers expressed agreement on the need for continued government supports for PEVs. Many signaled that current amounts were appropriate and should continue for the near to mid-term. Most agreed these programs were not particularly burdensome and many lauded changes to the HOV lane access decal program that afforded dealers the opportunity to obtain decals from California's DMV upon delivery from the manufacturer. This move afforded certainty for dealers, enabling them to market the benefit to customers, especially commuters near traffic corridors featuring HOV lanes. Dealers underscored the need for similar adjustments to other public incentives, namely pulling them forward to the point of purchase where the elements of immediacy and certainty reinforce their efficacy and bolster opportunities for dealers to market them more effectively. Some also advocated for dealer-targeted public incentives to reward dealers for the added burden of PEV sales and to more consistently incent sales people to pursue PEV sales efforts.

Does the Franchise Dealer Model Support PEV Market Growth?

We have presented data largely consisting of industry averages of customer satisfaction with the dealer purchase experience. But experiences can vary substantially from dealer to dealer. For PEVs, which require a robust support ecosystem to enable customers to realize the potential value of conveniences such as at-home fueling or HOV lane access, this initial data shows that with the exception of the most tech-embracing and forward looking dealers, traditional retail approaches likely fall short. However, within the franchised model, some dealers are implementing adjustments and adaptations to better serve the needs of plug-in vehicle buyers. Though these dealer innovators are blazing a trail for others to follow, it remains to be seen whether and at what rate these lessons diffuse through highly diverse dealer communities. Pursuing buy-in from dealers and sharing PEV "success stories" and best practices could speed uptake across these dealer segments.

It should not be inferred that all of the lessons and approaches implemented by dealer innovators and discussed here are applicable to all. This is especially the case where large up-front investments are required in market areas with relatively lower demand for PEVs. It is thus important that dealers have access to resources and methods that can be scaled appropriately according to local market conditions. Further, efforts to accommodate PEV buyers in a learning-friendly environment free of sales pressure could also improve the purchase experience. This entails eliminating activities that add little or no value at the physical facility and detract from activities of import to PEV buyers, including price negotiations, in-person paperwork, and associated wait times. While many of these same lessons may apply to conventional vehicles, the authors contend these are all the more important for plug-in vehicle buyers to make way for a number of higher value activities such as test drives, delivery, and the support products and services discussed previously.

Conclusions and Avenues for Future Research

The paper establishes that PEV buyers are substantially less satisfied with the dealer purchase experience than buyers of conventional vehicles. The early evidence points to customers with divergent expectations regarding the level of support they receive from dealerships. The paper contends that PEVs, insofar as these vehicles demand changes in behavior or that rely on new support infrastructure, entail attendant innovation in how these products are retailed to customers. As an asset, the inherent diversity of the dealer community can serve as a robust well-spring of innovation in retail activities promulgating PEV sales. However, this same diversity could also hinder the quality and pace of diffusion amongst dealers which, in turn, could (through a sub-par purchase experience) hinder the

quality and pace of diffusion of plug-in vehicles to customers. This dynamic may have repercussions for achieving ZEV targets and potentially other regulatory objectives. It is important that leaders consider the inherent constraints of existing industry configuration and institutional barriers when setting policy. Avenues for future research include opportunities to test hypotheses derived from findings presented here, such as whether steps taken to improve the PEV purchase experience can be correlated with PEV purchase satisfaction and/or impacts on PEV sales. Other avenues could include a greater exploration of factors contributing to the path and rate of diffusion of PEV uptake through the dealer community.

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