How Photographic Frames in Social Media Advertising can Influence the Purchase of Zero–Emissions Vehicles in British Columbia: a Mixed-Methods Study

by

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Abstract

Compelling communications strategies from government agencies, auto manufacturers, and pro-environmental groups will be needed in order to encourage the changes in consumer purchasing behaviour required to attain the government of British Columbia’s 2018 announcement that all personal use vehicles sold within the province are to be zero emission vehicles (ZEVs) by the year 2040. With a foundation in frame theory and the use of a mixed methods research approach, this study questioned which types of photographic images used in social media advertising best elicit the consumer behaviour of purchasing ZEVs. The triangulated results from a researcher-conducted content analysis, focus groups, and survey determined that the use of the following visual frames denote the most positive view of ZEV ownership: positioning ZEVs as discernably unique vehicles, highlighting the extensive range of ZEVs, the economic benefits of ZEVs, and positioning ZEVs as ecofriendly. Those involved in the promotion of ZEVs and their mass adoption in BC are encouraged to consider these frames in order to maximize the reach and impact of their communications efforts.

Keywords: Zero Emissions Vehicle, ZEV, frame theory, mixed methodology, content analysis, focus group, survey, range anxiety, social media, sustainable marketing,
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Introduction

Climate change has been in the public eye for decades and yet there continues to be societal ignorance and ongoing debate amongst world leaders and decision makers regarding the severity of the issue (Lewandowsky, Mann, Brown, & Friedman, 2016; Shove, 2010; Zorita, 2019). In order to prevent further environmental degradation, a substantial shift is required in the collective consciousness as to how individuals’ actions and behaviours can affect positive reparations towards climate change. Concurrently, the Canadian media landscape is changing at a rapid pace with more information being shared digitally every day: over 82% of Canadians used social media in 2019, and usage of visually-centric social media platforms like Facebook and Instagram continues to rise year over year (Insights West, 2019). These figures suggest that the visual message is becoming increasingly significant in contemporary Canadian communications: more and more, imagery is essential in the creation and deployment of effective communications strategies across all areas, including those to curb climate change.

The transport sector is a primary contributor to climate change worldwide, accounting for 23% of global greenhouse gas (GHG) emissions (Lévay, Drossinos, & Thiel, 2017). Per the International Energy Agency's 2019 global electric vehicle report (International Energy Agency, 2019), based on a worldwide average of carbon usage, the global GHG emissions of electric vehicles are almost half that of those emitted by internal combustion engine vehicles powered by liquid and gaseous fuel blends. In a determined effort to reduce the province's GHG emissions, in December of 2018 the government of British Columbia (BC) announced North America’s most forward-thinking zero-emission
vehicle standard to date: ten percent of all vehicle sales are to be zero-emission by 2025, increasing to thirty percent by 2030, and one hundred percent by 2040 (Axsen, Bruce, & Lightburn, 2019). Taking all this into consideration, my Master's thesis research investigated the types of visual communications, specifically the photographs utilized in social media advertising from automotive manufacturers, that best reflect the positive attributes of owning an electric vehicle. The aim of this research was to understand how best to visually position electric vehicles in social media promotional material in order to support the behavioural change resulting in the purchase of zero-emission vehicles (ZEVs).

This research utilized a mixed-methods approach, with the goal of providing a well-rounded study by drawing on the strengths of both qualitative and quantitative methods: utilizing qualitative analysis to gain a deeper understanding of the socio-cultural significance of the research, and following it up with quantitative analysis to establish the context and representativeness of the research (Merrigan, Huston, & Johnston, 2012; Watkins & Gioia, 2015). As will be expanded upon in the methods section below, the duality of perspectives that mixed methods research provides, was fundamental to discovering which photographs used in social media advertising promotes the behavioural change of purchasing a ZEV.

Drawing from frame theory – how related ideas are organized, debated, and presented in order to guide an intended audience’s interpretation of a message, with the communicator ultimately shaping the audience’s beliefs and values (Entman, 1993) – and its use in messaging to evoke behavioural change for the benefit of the environment (Altinay, 2017; Spence & Pidgeon, 2010; Von Borgstede, Andersson & Johnsson, 2013), my
research approach bridged pragmatist and constructivist paradigms. I believe in social constructivism, the belief that there are multiple realities in our world, each of which are socially constructed (Merrigan et al., 2012). I value and prioritize how inductive research provides a variety of truths that in turn shape the collective subjectivity of many individuals. My professional background in media and advertising, an industry that is rooted in the deductive reasoning that data from a proportionate sample is representative of an entire population (Hair, Celsi, Ortinau, & Bush, 2013; Hardy, Powell, & MacRury, 2018; Numeris, 2020), has also shaped my research paradigm and contributes to the pragmatic aspect found in my mixed methods research. My research began with my own content analysis review of photographic visual narratives used in social media, subsequently followed by focus groups, then a survey.

The mixed-methods research approach was purposefully exploratory and grounded in the ideal that the results of my research needed to be substantiated in both the scientific and communications communities/industries. As with other mixed-methods research that gauges the impact of climate change communications on behavioural action (Altinay, 2017; Chapman, Corner, Webster, & Markowitz, 2016; Gifford & Comeau, 2011; O’Neill & Hulme, 2009), the use of a qualitatively focused, sequential mixed methods approach, addressed the complex and nuanced question of which visual social media communications can influence behaviour change as it pertains to British Columbians’ purchasing of ZEVs by reflecting accurate and positive imagery of current owners’ experiences with ZEVs.

The project ultimately determined that the following particular themes best portray the contemporary experience of ZEV ownership in the Lower Mainland: utilizing clearly
defined signifiers that denote the promoted vehicle as electrically powered, demonstrating the range of the electric vehicle, highlighting the long-term fiscal savings of ZEVs compared to their ICE vehicle counterparts, and the environmental, climate change-mitigating benefits that ZEVs offer. The thematic incorporation of these elements into social media advertisements will in turn create the most positive representation of ZEV ownership in the Lower Mainland, thus contributing to the eventual goal of diminishing the British Columbian’s GHG emissions through total ZEV market penetration and saturation.

Note

The government of British Columbia currently classifies Clean Energy Vehicles (CEVs) as Battery Electric Vehicles (BEVs), Fuel Cell Vehicles (FCVs), and Plug-in Hybrid Electric Vehicles (PHEVs) (British Columbia, n.d.). Previously, conventional hybrid-electric vehicles (those that combine an electric battery and gasoline combustion) were also considered CEVs. I have drawn from research from various geographic areas and which investigated various types of CEVs. As the government of BC’s new mandate is for one hundred percent zero emissions vehicles (ZEVs) by 2040, and due to the fact that the average consumer is not aware of the nuanced differences between CEV types (Axsen, Langman, & Goldberg, 2017), I have used ZEV as an all-encompassing acronym.

Scope of Research: Definitions and Rationales

This project reviewed photographic imagery used in social media. For the purposes of this research, social media is here defined as a broad swath of internet-based websites and smartphone applications that ideologically and technologically allow for the creation
and exchange of user generated content, allowing users to bridge distance, time, and other traditional barriers of communication in order to create community gravitating around specific interests (Arora & Predmore, 2013; Hardy et al., 2018; Olivas-Lujan & Bondarouk, 2013).

The project focused on photographic imagery published on social media platforms between June 2019 and January 2020, with a primary focus on the social media feeds of automotive dealers in the Lower Mainland. The temporal boundaries were put in place due to both the fast pace of technological innovation seen within the ZEV industry as well as the constantly evolving scope of the digital media landscape. As such, images from the most recent six months in advance of commencing the research were reviewed. This period of time was purposively selected in order to strike a balance between researching the most current visual data, and therefore presumably reflective of contemporary trends in digital communications, and having a substantial volume of data that would allow for meaningful research conclusions. The Lower Mainland was used as the locational nexus for this research as the majority (61%) of the province’s population resides in the Lower Mainland region (Statistics Canada, 2017). Even recognizing that the region has access to a variety of transit options and extensive bicycle-lane infrastructure and their subsequence effect on vehicle ownership (Korstrom, 2017; Li, 2018), because British Columbians are buying more vehicles per capita than elsewhere in Canada (Statistics Canada, n.d.) it therefore stems to reason that the majority of vehicle sales in the province occur in the Lower Mainland. Moreover, within British Columbia, ZEV products are most prevalent and readily available for sale within the Lower Mainland: 54% of Lower Mainland dealerships have
ZEVs on their lots, versus 43% of those on Vancouver Island and the Sunshine Coast, 27% in the Interior of the province, and 7% in Northern BC (Smith, 2018). With ZEVs becoming steadily increasingly ubiquitous on the streets of the Lower Mainland (Smith, 2018), the Lower Mainland was determined as the optimal geographic locus for this research.

Because this research was for a Master's thesis that was researched and written within the span of 10 months, it was conducted succinctly and with the end goal in mind. It is my hope that this research conducted in the Lower Mainland will serve as a guidepost for communications strategies across the province, with the understanding that geography plays a role in consumer behaviour.

**Literature Review**

**Introduction**

My research paradigm stemmed from *frame theory* and its correlation to *scopic regime*: the cultural construction of what we see (Rose, 2016). Frames are constructed via the interaction between media, individuals, and culture. They draw attention to specific aspects of an issue and focus attention on that issue, with the media emphasizing certain messages or components already commonplace in our culture and therefore cognitively present and understood by an audience (Littlejohn, Foss, & Oetzel, 2017). Moreover, as visual representations have become central to communication and social life in contemporary Western societies, our modern forms of cognizance are dependent on the cultural constructs that create the visual messages surrounding us (Rose, 2016). As an academic researcher and media communications professional, these areas are of particular
Interest to me for, if we correlatively layer the principles of frame theory and scopic regime, it allows advertisers to systematically depict their products in a particular way that will appeal to their target audience. A foundational understanding of different audiences’ “ways of seeing” is of great use to marketers, who gainfully benefit from knowing that how an image is seen by particular audiences, who will look at it in particular ways, is equally as important as what is presented within the image itself (Rose, 2016, p. 18). Framing is commonly used in messaging to evoke behavioural change for the benefit of the environment (Altinay, 2017; Chapman et al., 2016; Gifford & Comeau, 2011; C. Jones, Hine, & Marks, 2017; M. D. Jones & Song, 2014; O’Neill & Hulme, 2009; Spence & Pidgeon, 2010; Von Borgstede et al., 2013; Whitmarsh & Corner, 2017). There is little argument amongst researchers about the validity of using image frames in climate change communications, however there is an apparent void in the literature as to how and why certain image frames shape how people conceptualize and take action against climate change (Boomsma, Pahl, & Andrade, 2016; Chapman et al., 2016; Gifford & Comeau, 2011). My research aimed to begin to fill that void by determining which characteristics in photographs used by automotive manufacturers in social media advertisements best reflect a positive frame of ZEV ownership, thus encouraging others to undertake the high-impact, individually-based, emissions-reducing behaviour of purchasing a ZEV. This review outlines how other researchers and communications practitioners have utilized various forms of frame theory and mixed-methods research to shape climate change communications, the current state of British Columbia’s ZEV mandate, and delves into marketing of sustainable behaviour, with a focus on the segments of the ZEV market. These areas of study shaped the foundation of
my research by validating my chosen methodology, understanding the landscape of how ZEV purchase incentives are currently communicated in BC, and provided guidance as to how these communications strategies can be improved. Combined, they support my research goal of determining how photographic depictions of ZEVs and visual themes of climate change utilized in social media advertising can result in ZEV purchasing.
Mixed Methods Research and Frame Theory in Climate Change Communications

As will be outlined throughout this section, mixed methods research and frame theory are both prevalent in the literature on climate change communications, and prove to be particularly useful when analyzing visual narratives. While there has been other visual semiotic focused research into climate change messaging, photographic visual communications have not been analyzed to the same extent as written communication strategies (Altinay, 2017; Boomsma et al., 2016; Chapman et al., 2016; Nisbet, 2009): there is a “puzzling and problematic” (Chapman et al., 2016, p.172) lack of research on how visual imagery influences climate change communications. The need to develop communications strategies with mass appeal, the fact that visual media is becoming ever increasingly prevalent with the rise of social media platforms such as Facebook and Instagram (Insights West, 2019; Young, 2018), and the scarcity of visual semiotic research pertaining to environmental issues influenced the path of my Master's research both contextually and methodologically.

As supported by the literature on the subject, a mixed methods approach can be instrumental to research success by providing a usable model for visual communications strategies that encourage pro-environmental changes in purchasing behaviour. Doug McKenzie-Mohr's (2011) seminal text for sustainability-focused communications professionals provides a step-by-step guide on how to implement social marketing plans to encourage behavioural changes and sustainable action: pivotal to his community-based social marketing strategies is the use of qualitative research (focus groups) followed by a quantitative survey to ensure a representative, generalizable outcome. Authors such as
McKenzie-Mohr (2011) and Carmichael and Brulle (2016), stress the importance of having scientific, empirically grounded data (such as quantitative survey data) to validate the messages contained in climate change communications. Chapman et al. (2016) also extol the virtues of a mixed-methods approach: their research is purposefully exploratory in nature (an inherent quality to mixed-methodology) with the overarching objective of being able to make practical and actionable climate change communications recommendations.

As expanded upon and substantiated in the next paragraph, the incorporation of both qualitative and quantitative data ultimately makes the research findings more amenable to the scientific community surrounding climate change studies, public policy makers, and the marketing professionals responsible for creating communications strategies on the matter, such as my research to promote the purchase of ZEVs.

The use of quantitative data, typically considered more scientific and certifiably empirical (Merrigan, Huston, & Johnston, 2012), dovetails with other literature that emphasizes the necessity to approach climate change communications with the same level of scientific scrutiny that climate change itself receives (Chapman, Lickel, & Markowitz, 2017). This can be achieved through message tailoring or framing, which inherently has a more intentional and nuanced approach than “simple” emotional appeals often found in climate change communications (Chapman et al., 2017, p.850), such as showing a distressed polar bear on a shrinking ice floe eliciting emotions of sadness and fear.

Frame theory examines cognitive behaviour and is frequently used by the media to adeptly communicate specific cultural and political ideals and beliefs (Entman, 2003; Lakoff, 2004, 2008; Littlejohn et al., 2017). Robert Entman (2003) provides the following
“standard definition” of framing: “selecting and highlighting some facets of events or issues, and making connections among them so as to promote a particular interpretation, evaluation and/or solution” (p.5). Framing shapes and determines human interactions and behaviours, and our understanding of them: “[social frameworks] provide background understanding for events that incorporate the will, aim, and controlling effort of an intelligence, a live agency, the chief one being the human being” (Goffman, 1974, p. 22).

Frames are the mental structures that humans use to situate ourselves in our social-cultural surroundings, shaping the way in which we see the world (Goffman, 1974; Lakoff, 2004, 2008). Yet we are often unaware of the frames themselves: frames are part of the “cognitive unconscious”, the system of concepts that structure our ways of thinking and knowing (Goffman, 1974; Lakoff, 2004, 2008). The use of framing in mass communication strategies – proliferated through institutions, industries, cultural practices, and the media – operates by highlighting particular points of information in the communication (be it textual or visual) thereby elevating their salience, subsequently making those specific pieces of information more observable, meaningful, or memorable to the intended audience: in essence the frames are “made real” (Entman, 2003; M. D. Jones & Song, 2014; Lakoff, 2010). By selecting and highlighting specific areas of messaging, the communicator has the capacity to shape the reception of the message by the intended audience: frames “promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described” (Entman, 2003, p. 53). By utilizing framing, communicators can create a tailored language that effectively evokes ideas of a specific viewpoint (Lakoff, 2004). What’s more, is that because frames are mental
structures that shape the way in which humans see the world, strongly held preexisting frames have the ability to override the presentation of newly presented facts (Lakoff, 2004, 2010). In order for a new frame to be successfully received by and resonate with its intended audience, it must work cognitively and emotionally within an existing system of frames (Lakoff, 2004, 2010).

The use of framing of visual messages as it pertains to climate change communications is pervasive across the literature on the subject. Underscored by its behavioural science perspective, framing is widely used in climate change communications that seek to elicit behavioural change because the emphasis on a particular story or frame demonstrates why climate change is relevant to the target audience in question (Altinay, 2017). Ultimately, by using frame theory researchers are able to tap into messages that better resonate with their target audiences to promote behaviours and actions that can mitigate climate change.

One such example of a frame is the positioning of pro-environmental behaviour (such as purchasing a ZEV) as a benefit to an individual’s well being. Researchers Schmitt, Aknin, Axsen and Shwom (2018), analyze “prosocial” behaviours - those that benefit others now and into the future – and their subcategory of “pro-environmental” behaviours. Following an assumptive belief that humans feel good after helping others, Schmitt et al. (2018) suggest that an individual’s pro-environmental behaviour correlates to their well being. By examining the relationship between individual pro-environmental behaviours and life satisfaction as a function of direct cost (time, effort and/or monetary), socialness, and how much the behaviour can be publicly observed, it is determined that the
relationship between pro-environmental behaviour and personal well-being is stronger for
behaviours associated with higher costs of time, money, and effort (Schmitt, Aknin, Axsen,
& Shwom, 2018). This research reinforces a potential frame for visual communication
strategies for ZEVs: that the purchasing of a ZEV will not only benefit the greater
environment, but also lead to the purchaser’s individual benefit of increased well being.

The use of mixed-methods research methodology and frame theory is a proven
structure for communications strategies focusing on climate change. Utilizing a mixed
research methodology of a content analysis, focus groups, and a survey provided a strong
theoretical foundation to determine which visual frames or stories best resonated with
current ZEV owners as representative of their vehicular ownership experiences. I was thus
able to make recommendations on how to improve upon those frames in photographic
social media promotion to encourage greater ZEV purchase adoption.

**Current Status of ZEV Market in British Columbia**

An understanding of the current ZEV market in British Columbia is crucial to
producing effective communication strategies to grow ZEV sales now and into the future.
This section will review ZEV market penetration currently in BC, outline challenges
currently facing ZEV market growth, and the call amongst ZEV adoption advocates for a
provincial ZEV mandate.

The ZEV market in British Columbia has grown significantly over the past ten years,
and ZEV ownership has particularly climbed in the past five years. Recent data shows, that
in 2017 and the first quarter of 2018 alone, there were 4,670 ZEVs sold, which almost
matches total sales between 2013 and 2016. BC also has the highest market share of ZEVs in Canada, and has for a number of years (Capital Regional District, 2018; Electric vehicle sales in Canada – Q3 2019, 2019). The province offers purchase incentives between $1,500 and $3,000 for the purchase of ZEVs, which can be combined with the Canadian “Federal iZEV Program”, offering incentives between $2,500 and $5,000 for the purchase of ZEVs, and the BC Scrap It Program which offers either $3,000 or $6,000 rebates when British Columbians replace their higher polluting vehicles with either used or new ZEVs (British Columbia, n.d.; Plug In BC, n.d.). In total, British Columbians can receive up to $14,000 in incentive rebates off the price of their ZEV. ZEVs are becoming increasingly normalized in BC, with one in three British Columbians stating that they expect their next car to be a ZEV (Smith, 2018). While these figures could lead one to believe that ZEVs are becoming ubiquitous in BC, the reality of obtaining a ZEV is not an easy one for British Columbians today in 2020.

ZEV ownership and a general desire for the product is growing, yet challenges regarding ZEV availability remain: only 40% of BC automotive dealerships have ZEVs available on their lots and some dealers cite a wait time of up to 18 months to receive one (Smith, 2018). These figures are even more drastic in Interior and Northern BC where only 27% and 7%, respectively, of dealers have ZEVs available for purchase (Smith, 2018). Other North American districts such as Quebec and California have stringent ZEV mandates in place (Axsen et al., 2019; International Energy Agency, 2019; Smith, 2018). The mandates are based on complicated credit systems that necessitate that auto manufacturers sell a certain number of ZEV credits in the district (Axsen et al., 2019; California Air Resource
Board, 2020; Quebec, 2020). The particulars of the mandates are not germane to this literature review, however the very existence of the stringent mandates in Quebec and California means that auto manufacturers prioritize the distribution of ZEV products in these districts, limiting the availability and diversity of models available today in British Columbia (Smith, 2018). In order for the province to reach its long term legislated climate goals and to fill the consumer desire for ZEVs, agencies such as Clean Energy Canada (Smith, 2018) and the David Suzuki Foundation (Axsen et al., 2019) are calling for a ZEV mandate in BC that would regulate and necessitate a standard of sale of ZEVs in the province.

According to Axsen et al.’s (2019) report for the David Suzuki Foundation, a ZEV mandate in BC would be beneficial for the following reasons:

- Encourages ongoing technological and creative innovation in the automotive sector.
- Increases vehicle availability and provides more choice to consumers in BC.
- Ultimately increases ZEV sales.
- Benefits the environment by decreasing carbon emissions.
- Can be designed to be lower cost to the government (and ultimately taxpayers) than cash incentive programs.

A strong ZEV mandate would signal to automakers that there is a demand in for ZEVs in BC. Smith’s 2018 report for Clean Energy Canada and Axsen et al.’s 2019 report for the David Suzuki Foundation suggest modeling a ZEV mandate after the current ones in place in California and Quebec, but caution that they may be too focused on innovation, overly regulated, and unnecessarily complex in providing different rating systems for different types of electric vehicles. BC would be better served to implement a simplified system that
treats all ZEVs the same with the singular goal of increasing ZEV sales (Axsen et al., 2019).

The current state of ZEV policy and regulation is in flux in British Columbia. Environmental advocate agencies, government, and automotive manufacturers will all need to take the transformative nature of the market into consideration while developing their communications strategies. My research goal of understanding the types of visual communications that influence purchase action of ZEV can help inform these organizations as they roll out their marketing strategies and how they can interact with a ZEV mandate during this pivotal time for ZEVs in BC.

**Segmenting the ZEV Market**

As consumers differ in their tastes, perceptions, and motivations, it is helpful for marketing professionals to group their target audience into specific segments based on their preferences and subsequently tailor communications to said segments (Axsen, Goldberg, & Bailey, 2016; Rogers, 2003). As outlined below, this is pertinent in climate change communications that pertain to ZEV usage adoption in British Columbia because there will need to be effective communication to all segments of the province’s population. Researchers have reviewed and tested different models of segmentation for new and technologically inventive products, including ZEVs, and found trends in regards to product innovation’s relation to social status (Axsen et al., 2016; Noel, Sovacool, Kester, & Zarazua De Rubens, 2018; Peters, Axsen, & Mallett, 2017; Rezvani, Jansson, & Bodin, 2015).

The majority of climate change communications strategies are set by scientists and/or public policy makers who determine the dominant discourse on the environment
(O’Neill & Hulme, 2009). With many issues of the environment being predominantly concerning to those with more liberal political inclinations (Hmielowski, Feldman, Myers, Leiserowitz, & Maibach, 2014; Maibach, Leiserowitz, Roser-renouf, & Rosenthal, 2015; Sharman & Howarth, 2017), climate change communications can have the tendency to alienate members of the public whose political viewpoints are more conservative or traditionally right of centre (Whitmarsh & Corner, 2017). Increasingly, research and literature are focusing on the necessity for climate change communications to have mass appeal to affect substantive behavioural change amongst the general public, and how this can be achieved (Carmichael & Brulle, 2016; Chapman et al., 2016; Gifford, Kormos, & McIntyre, 2011; M. D. Jones & Song, 2014; Sharman & Howarth, 2017). A dominant thread within the literature on climate change communications emphasizes the need to build communications plans that resonate with the environmentally disengaged on psychological and attitudinal levels to promote sustainability on a larger scale through mass changes to purchase behaviour (McKenzie-Mohr, 2011; O’Neill & Hulme, 2009; Von Borgstede et al., 2013; Whitmarsh & Corner, 2017). This will be necessary in order to shift to 100% ZEV usage within two decades’ time, per BC’s recent declaration.

Segmenting the market for environmentally ethical consumption is crucial to advertising to those typically disengaged from issues of sustainability, and more specifically, who are naïve to the personal, societal, and environmental benefits of ZEV ownership, such as lower personal costs for day to day upkeep of the vehicle, and contributing to lower greenhouse gas emissions, thus benefitting the environment and overall health of society by having less pollutants in the air (Axsen et al., 2017; Axsen &
Wolinetz, 2018; Peters et al., 2017). There are a few models of marketing segmentation that are commonly used when segmenting the ZEV market. Rogers’ (2003) model of diffusion of innovation divides the market into consumer categories of innovators, early adopters, early majority, late majority and laggards. This model has been widely adopted across many industries (Rogers, 2003), and has also been popular in the marketing of sustainable behaviour in general (McKenzie-Mohr, 2011) and ZEVs specifically (Axsen, Goldberg, & Bailey, 2016; Noel, Sovacool, Kester, & Zarazua De Rubens, 2018). Noel et al. (2018) expand upon Rogers’ model combining it with Thornstein Veblen’s (Veblen & Banta, 2009) framework of conspicuous consumption that centers around the idea that individuals are decidedly focused on obtaining wealth with the goal of conspicuously demonstrating that wealth in order to improve their social standing. Conspicuous consumption is intrinsically linked to status seeking behaviour (Noel et al., 2018). By combining Rogers and Veblen’s models, Noel et al. (2018) coin the term “conspicuous diffusion” which holds the tenets that 1) higher social classes will overtly consume to differentiate themselves from lower classes, and 2) lower classes will attempt to emulate the higher socioeconomic class in the attempt to garner a similar status. Moreover, conspicuous consumption dovetails with the diffusion of innovation theory in that innovators typically buy products that are in early development and thus more costly. The purchase’s monetary value declines at the same rate as mass adoption increases as one moves through Rogers’ model from innovators through laggards (Noel et al., 2018). For Noel et al. (2018), this is of utmost import for the policy surrounding the marketing of ZEVs: “if an innovation is particularly conspicuous and has benefits for society, like [ZEVs], then the government should seek to harness and utilize
the conspicuous aspects of the innovation to drive further adoption, viewing luxury innovations...as necessary first step towards full adoption” (p.166). This framework of segmentation recognizes that there are numerous reasons why individuals purchase ZEVs, not only for technological innovation or environmental benefit.

Jonn Axsen is a prominent ZEV researcher at Simon Fraser University in Burnaby, BC, who along with his colleagues, takes a similar stance to ZEV market segmentation. They recognize that ZEV buyers are driven by a variety of motives and thus suggest a segmentation of the current and potential future ZEV market according to actual behaviour and stated behavioural intention (Axsen et al., 2016, 2017). Axsen et al. (2016) divide the ZEV market in British Columbia into categories of “pioneers” (those who bought ZEVs when they first came onto the Canadian market in the 2000s), “potential early mainstream” (consumers who currently own a gasoline-powered vehicle but have shown an interest in purchasing a ZEV within the next 10-15 years), and “late mainstream” (current gasoline powered vehicle owners who have not shown an interest in ZEVs). Similarly to the findings of Noel et al. (2018) referenced above, Axsen et al. (2016) found that “pioneers” reported significantly higher average household incomes and significantly higher awareness of ZEVs than the mainstream respondents. Also of import is that both early and late stage mainstream buyers had little knowledge of the differences between the types of electrified vehicles available on the market (PHEVs versus BEVs, for example) and thus informational and marketing campaigns need to focus on these differences so that potential consumers understand what’s available to them in the marketplace (Axsen et al., 2016). Awareness and functional understanding of a product are critical elements to a consumer's purchase
decision-making process.

This was further examined in a subsequent study run by Axsen and others (2017), specifically examining mainstream consumers’ perceptions of electric drive vehicles and charging station infrastructure. Two significant themes presented themselves in this study: that a basic understanding of and access to charging infrastructure was paramount to the consumer’s ability to conceptualize purchasing a ZEV, and that there was much confusion amongst the mainstream consumer regarding how ZEVs function (Axsen et al., 2017). As such, communications campaigns from both governmental policy agencies and the automotive industry, must focus on growing mainstream consumers’ basic awareness of ZEVs and their attributes that are most appealing to a general consumer base (for example that ZEVs make less noise than gasoline fuelled cars) in order to address the ongoing socio-cultural naivety surrounding ZEVs (Axsen et al., 2017). The majority of the population falls into the “mainstream” segment and there remains much confusion surrounding ZEV functionality within this segment (Axsen et al., 2017). My research aims to speak to mainstream segment of ZEV buyers in BC to expedite the change in purchase behaviour required to reach 100% ZEV market penetration by 2040.

Marketing and communications strategies surrounding ZEVs, from government agencies, automotive manufacturers, and pro-environmental organizations need to increase the general population’s awareness and knowledge around ZEV functionality, range, and charging infrastructure. Utilizing segmenting tactics can aid in tailoring messaging to specific audiences’ psychographic, demographic and geographic profiles within British Columbia. Utilizing such segmentation tactics was necessary within my
research as well to determine the specific types of visually based promotional campaigns that yield ZEV purchases.

**Literature Review Conclusion**

As supported by the literature on the subject matter, the use of a mixed-methodology and a paradigmatically frame theory-centered approach to my research question helped shape my research on developing a communications framework to encourage those British Columbians interested in new vehicle ownership to engage in the climate change mitigating behaviour of purchasing a ZEV. Taking this proven paradigmatic approach, as well as having a thorough understanding of the current state of affairs of the ZEV market in British Columbia, allowed me to research and engage with audience segments with a significant knowledge-base of the current ZEV market and lifestyle, in order to assess and determine which kinds of photographs to include in communications plans to generate mass adoption of ZEV purchasing.
Methods Sections

By utilizing a mixed methods research approach of a content analysis, qualitative focus groups, and a quantitative survey, my research questioned which types of photographic images incite the desire to buy ZEVs, why they provoke these desires, and how they can effectively trigger behavioural change.

Epistemic, Paradigmatic, and Theoretic Assumptions

My research approach bridged pragmatist and constructivist paradigms. I believe in social constructivism, and value and prioritize the import of a variety of truths that come from the collective subjectivity of many individuals. In order to accomplish this a researcher needs to look at people’s behavioural patterns. I believe that this sort of paradigmatic approach is necessary in order to understand a communications campaign’s target audience, to make it marketable, and for it to resonate with its intended audience(s). Because of this, my research approach was fundamentally inductive.

That being said, my professional background is in media and advertising, an industry that is rooted in the pragmatic, deductive reasoning that data from a proportionate sample can be representative of an entire population (Hair et al., 2013; Hardy et al., 2018; Numeris, 2020). This had a large effect on my views regarding research validity as they pertained to this research endeavour. My research delved into the behavioural and purchasing patterns of British Columbians who, as I know experientially, having developed and managed province-wide advertising campaigns, have varying, and even opposing, psychographic profiles. This diversity of consumer behaviours influenced
my mixed approach: I wanted to be able to capture the inductive elements of British Columbians’, and in particular Lower Mainlanders’, thoughts, feelings and, ultimately, actions as they pertain to ZEV purchasing and ownership through qualitative research, and then test these findings quantitatively to see if they were replicable and generalizable for government and manufacturer marketing purposes.

Additionally, I would be remiss in not mentioning my own researcher bias. As mentioned, I have a professional background in media and I also have personal affiliations with organizations and individuals who work in climate action policy, including efforts for the mass adoption of ZEVs. This is where a critical aspect of my epistemic approach comes into practice, as it was and continues to be, my hope that that my research will act as an agitational voice for the environment.

An alternate, fundamentally critical epistemic research approach could have allowed for an examination of the larger socio-political power structures and cultural practices that contribute climate change and the emissions of GHGs. Gas emitting vehicles are by no means singularly responsible for climate change (International Energy Agency, 2019), and, what’s more, like many mass produced products, despite their use of “clean energy” (note the frame), ZEVs are not completely absolved from having an impact on the environment (International Energy Agency, 2019; Lévay et al., 2017). I recognize, acknowledge, and, ultimately, support that more significant public policy and infrastructure focus on the environment (for instance, more attention and funds allocation to public transit) could have significant impacts for climate change mitigation. Furthermore, in the discussion of ZEV purchasing in British Columbia, there is also the
question of affordability of these vehicles for the general population. While I understand the larger context of economic and socio-political structures at play in the mitigation of climate action, because of my personal interests and professional background in marketing I purposively chose to explore my research question through a behaviourally focused communications tradition, by focusing interpretatively on the audience’s views on the visual depiction of ZEVs. For while the BC government has taken a pivotal step in beginning to curb climate change through this new ZEV legislation, the fact that only 3.5% of vehicles sold in the first half of 2018 were electric (Shore, 2018), makes the shift to 100% ZEVs by 2040 an uphill climb within the province’s social, political and consumer constructs. I want to encourage climate change mitigating behaviours within the current structures of discursive power within British Columbia.

My research was rooted in frame theory and visual semiotics. The canonical semiotic work of Charles Saunders Peirce is of particular importance when examining the role that semiotics can play in the effectiveness of any sort of mass communications, including messaging surrounding ZEVs. Peirce’s view on semiotics was founded in the “triangle of meaning”: that meaning comes from a relationship between “the object (or referent), the person (or interpreter), and the sign or symbol” – where “the sign” represents “the object” in the mind of the “interpreter” (Littlejohn et al., 2017, p. 102). Thus, from a Peircean semiotic perspective, where communications surrounding the purchasing of ZEVs is concerned, how they are understood and given meaning is through the person who is hearing or seeing the message. Multiple researchers have pointed to the need for more studies into the effects that visual narratives have on climate change
communications (Chapman et al., 2016; Walsh, 2015). Adopting a semiotic lens for the strategic design of visual narratives aimed at specific audiences will be key to how communications professionals can begin to disseminate marketing strategies promoting ZEV purchasing. At the most basic level, a semiotic sensibility will serve communications professionals well in their mission, as this body of theory offers a them a place to ground both their and the intended audience’s understanding of the communication message (Littlejohn et al., 2017). Visual communication messages are even more reliant on an understanding of semiotics for their success as “images require pattern recognition, organization, and discrimination, not just representational connections” (Littlejohn et al., 2017, p. 103). Peirceian semiotics and the related area of social semiotics takes the stance that an object cannot have meaning outside of the larger contextual frame of the sociocultural landscape within which it is created however the ultimate source of meaning making is with the individual(s) viewing the image, and their specific social situations and practices (Rose, 2016). Therefore to interpret a visual image one has to understand audiencing: the process by which an image is given its meaning by particular audiences viewing it in specific circumstances including how technology and social practices mediate the interpretation of said image (Rose, 2016). This is of critical import when creating visual marketing and promotional messaging as the significance of the advert imagery will be meaningless without an intentional understanding of what motivates and is of significance to its intended audience (Rose, 2016). As will be expanded upon at length in this section, this theoretical approach influenced the generic research methodology utilized as well as the specifics of the audience profiles of the research subjects and participants.
Discussion of Methodology

The use of a hybrid constructivist and pragmatist epistemological research approach fits within the established framework of mixed methods research. While different authors address paradigmatic approaches in varying manners, there is a general consensus that mixed methods research is an ideal methodology to use when approaching a research question from multiple angles, looking at complex issues and finding multiple truths to a certain social phenomenon (Hesse-Biber, 2010; Johnson, Onwuegbuzie, & Turner, 2007; Nash, Memmott, Reser, & Suliman, 2018; Onwuegbuzie & Leech, 2006; Pluye & Nha Hong, 2014; Uprichard & Dawney, 2019; Viswanath, Brown, & Bala, 2013; Watkins & Gioia, 2015). The mixed methods perspective was then a natural fit to research such as mine, seeking to find the kinds of visual communications that ultimately resonate with a broad spectrum of individuals on a topic that can have both individual financial and large scale environmental benefits, and aims to initiate behavioural changes.

Fundamentally, mixed methods research combines quantitative and qualitative approaches in order to expand the breadth and depth of the understanding of the research question (Johnson et al., 2007; Plano Clark & Ivankova, 2017). Mixed methods allow researchers to ask more encompassing research questions, tapping into both the “what” and “how” of a certain phenomena, by giving qualitative “voice” to the “numbers” of quantitative research (Watkins & Gioia, 2015, p. 5). Furthermore, by embracing both the subjective voice (qualitative) and objective numerical (quantitative) sides of the proverbial research coin, the researcher becomes a “pragmatist”: “pragmatists decide what they want to research, [and] then study the topic in a way that is congruent with their value system”
(Tashakkori & Teddlie, 1998, pp. 26). To this end, my research fits with in a pragmatic epistemology in that I am utilizing mixed methods specifically in order to have research findings that tap into emotional appeals while also being grounded in quantitative data to serve my end goal of having conclusions to influence effective communications strategies.

My mixed methods research choice speaks to a critical paradigm as is outlined by other literature on mixed methods and also helps to begin to fill a void of mixed methods research with an advocacy lens that exists currently (Creswell, 2010; Plano Clark & Ivankova, 2017). The literature points to other research specifically on climate change communications utilizing mixed methods because of its abilities to both speak to the social and behavioural aspects of society as well as give it credence within the quantitatively-focused scientific community (Chapman et al., 2016; McCrudden & McTigue, 2018; Nash et al., 2018). It is likely that more and more climate change focused communications research will begin to utilize mixed methodologies as “the epistemological boundaries that historically separated climate science and the humanities and social sciences [are becoming] new sites of interdisciplinary engagement and collaboration” (Nash et al., 2018, p. 110). Mixed methods can bridge the gap between the objectivity traditionally required of scientific inquiry and the innate subjectivity of human communications.

Data

My research followed an intentionally sequential and exploratory approach: I conducted a primary content analysis of photos used in current ZEV social media promotion, followed by qualitative focus groups, ending with a quantitative survey.
The nature of a sequential mixed methods approach is that the results from one method (in my research’s case, qualitative) will be implemented first, and subsequently inform and shape the use of the other (quantitative) method (Plano Clark & Ivankova, 2017). In a sequential exploratory mixed methods design, such as mine, the qualitative aspect of the research is considered fundamental to the project and generates the specific theoretical constructs of the research design (Hesse-Biber, 2010). Though traditionally mixed methods research designs typically place the quantitative portion of the study prior to the qualitative (Brannen, 2008), the rationale for this inversed approach was that I first wanted to discover some of the more socially and culturally situated meanings and experiences that people have with visual representations of communication messages focused on ZEVs. With an understanding that “qualitative research alone cannot examine the prevalence or predictive power of such constructs” (Plano Clark, 2017, p. 305), the follow-up quantitative survey further validated the findings of my qualitative research.

**Data gathering and analysis.**

**Content analysis.**

Photographs are used in a variety of advertising media: newspaper, magazine, online, and out of home placements such as billboards, transit shelter advertising, marquees, and bus wraps. In order to be able to provide content to discuss in the focus groups and survey, I first conducted a content analysis of photographs in current social media-based advertisements of ZEVs. I focused on photographs in social media advertisements because their pervasiveness in the Canadian media landscape: 84% of
Canadians use social media (Insights West, 2019) versus magazines and newspapers reaching only 51% and 52%, respectively, of Canadians over the age of 18 on a weekly basis (Young, 2018). While out of home media also has a significant reach (Young, 2018), the focus was on social media as the nature of the medium is more personal: the individual user is tactically engaging with their digital device and interacting on the social media platform versus passively walking by a traditional out of home poster or display. Moreover, as stated by Gillian Rose (2016) in her comprehensive overview of visual research methodologies: “a medium is often understood as both the technology of transmission and the sort of image it carries” (p. 38). As social media is inherently defined as relational between various users engendering niche communities gravitating around specific interests (Hardy, Powell, & MacRury, 2018), there are therefore opportunities for advertisers, in this case automotive brands specifically, to create promotional images that best serve the targeted, conversational, and personal nature of the medium.

The scope of the analysis focused on automotive brands that manufacture 100% electric vehicles (not hybrid or partial zero emission vehicles), and that qualify for both BC’s CEVforBC cash incentive and the Canadian government’s cash incentive for ZEV purchasing. These parameters were determined in recognition of the province of BC’s goal to have all vehicle sales be ZEVs within 20 years’ time, and in an effort to be reflective of vehicle price points that would fit the budget of the majority of Lower Mainlanders. The vehicle brands reviewed included: BMW, Chevrolet, Ford, Hyundai, Kia, Mini, Mitsubishi, Nissan, Smart, Tesla, and Volkswagon (note that not all these brands had social media accounts that met the parameters below). As I wanted my research results to be applicable
to and utilizable in communications strategies aimed to most of the population, my content analysis focused on photographs of ZEV models that qualified for government purchase incentives and rebates. The province’s Clean Energy Vehicle Program grants the purchaser or lessee of vehicles with suggested retail prices under $55,000 a point of sale incentive of up to $3,000, depending on vehicle type and battery capacity (CEV for BC, 2020). I operated under the informed assumption that the vehicles available for the CEV incentive program would be those most likely to be affordable by the majority of the population.

Instagram and Facebook were chosen as the social media channels from which to review images. This is due to the pervasive nature of both those social media channels (Insights West, 2019) and their heavy reliance on and widely accepted use of visual storytelling (Fitzpatrick, 2019; Insights West, 2019; Young, 2018). In an effort to be as representative of the types of social media accounts that Lower Mainlanders would follow, a focus was put on local dealer social media accounts, followed by Canadian brand accounts. Global marketing/brand accounts were reviewed if no other more regionally focused accounts were found, or were in existence but infrequently updated.

Images from both paid advertising and organic social media content were reviewed and referenced throughout the course of the research. Organic content is that which brands post to their social media channels and is seen by people electing to follow said content, as opposed to paid advertising which is sponsored content targeted to audiences, often based on demographics and psychographic behaviours (Gurd, 2019). With the ever-evolving digital media landscape, there is a general acceptance that proprietary social media pages, like branded websites, are ubiquitous and analogous to advertising promotion: the
consumer perceives them all as a seamless, mediated communication with the brand (Hardy et al., 2018). As such, for the purposes of this research, all social media content, regardless of its source of origin, was considered to be promotional in nature.

Knowing that the content analysis would be triangulated with more formalized, data-driven qualitative and quantitative research stemming from the focus groups and survey, and recognizing the challenges regarding the fragmentation and disregard for the interconnectivity of aspects of visual imagery when imposing rigid coding methods (Rose, 2016), a purposively casual approach was taken in conducting the content analysis. I both recognized and capitalized upon my own researcher bias: in early 2020 I was in the market for a new vehicle and had decided to make the switch from a hybrid to a fully electric vehicle. I had certain, specific parameters that my vehicle purchase had to ultimately meet, however, they were not extensive in scope: the vehicle would need to qualify for government incentives, be large enough to accommodate two rear-facing car seats without encumbering the driver and front-seat passenger, have significant range that it would not necessitate daily charging, and have a hatchback. While I recognized that these criteria would not be universally reflective of the needs/desires of other Lower Mainlanders in the market for a ZEV, I operated under the assumption that others would have their own unique list of requirements, similar in size/length and scope. Ultimately, while gathering data for my content analysis, I was also able to experience first hand the process a consumer would go through when looking for information on social media platforms for information regarding the ZEVs available to them.
While casual in initial approach, foundationally, my cognitive approach to the data gathering portion of the content analysis was influenced and steered by a theoretical methodology which both recognizes and requires that the image does not and cannot exist on its own but rather makes meaning by particular spectators who see the image in a particular way, or frame (Littlejohn et al., 2017; Rose, 2016). My unique position as an active consumer for a new ZEV allowed for me to fully embrace the experience of reviewing social media content and defining specific themes/frames. Specifically, I focused on frames within the images that exhibited what the viewer could gain from ZEV ownership.

**Focus groups.**

Three focus groups were conducted between January 25, 2020 and February 15, 2020, with a total of 14 participants. The questions posed in the focus groups are found in Appendix A. The participants were primarily ZEV owners, who had purchased their vehicles within the past 12 months. There were four participants who were not currently ZEV owners, but who had put deposits down on vehicles and were expecting to take ownership of new ZEVs within the next 12 months. The focus groups were all conducted in Vancouver, BC: two focus groups were conducted at the Point Grey campus of the University of British Columbia, and the third was conducted at Emily Carr University. All focus group participants were residents of the Lower Mainland.

The characteristics of the desired participants were selected because their recent experiences in purchasing ZEVs reflected how consumers in British Columbia are currently purchasing and acclimatizing to ownership of ZEVs: their exposure to advertising, the channels they use for researching ZEVs, their interactions with car dealerships, and their
Focus group participants were recruited through various channels including personal networks (including social media connections), the Emotive electronic newsletter subscriber list, the Vancouver Electric Vehicle Association (VEVA), and the British Columbia ZEV Owners Group on Facebook. Each focus group was approximately an hour in length, for which participants were offered refreshments and a $20 honorarium for their time and transportation costs.

The focus groups were audio recorded and later transcribed by an external service. The transcripts were uploaded into the qualitative coding software MAXQDA, where they were unitized, and then coded into categories both germane to ZEV ownership in general and specifically regarding the thematic frames within the images presented to and discussed amongst the focus group participants. Categories concerning an overview of ZEV ownership included: educating the public on ZEVs, the barriers to ZEV ownership, the deciding factors to purchase a ZEV, the (great) reality of ZEV ownership. The focus group discussions on images ultimately fell into two categories, the negative and positive use of frames present in the photographs discussed, with four subcategories flowing out of each respectively.

Survey.

A survey was sent out via the online platform SurveyMonkey, and a total of 121 responses were received between March 3 and 25, 2020. The survey questions are found in Appendix B. The survey was conducted in English language only, as while there are certainly large segments of BC’s population that speak Mandarin, Cantonese and Punjabi, I did not have access to translation services and English is still the predominant language
spoken across BC with 90% of the province’s population having knowledge of English (Statistics Canada, 2017a).

A similar target audience to that of the focus group was sought after: participants were individuals that had either purchased a vehicle (any fuel type) within the past year or intended to purchase one in the coming year. As mentioned, 121 individuals took the survey, and due to disqualifying questions and user drop off, the completion rate was 56%. There was a total of 36 questions and the average time spent on the survey was four minutes and seventeen seconds (though of those who completed the survey, that time spent average increased to ten minutes and seventeen seconds).

The survey was disseminated via personal email, e-newsletters from the Vancouver Electric Vehicle Association and Emotive, and through various social media channels, including online groups promoting ZEV ownership in the Lower Mainland. The survey respondents identified as 65% male, 35% female, and were spread across various age demographics: 18% were aged 25 to 34, 21% were aged 35 to 44, 29% were aged 45 to 54, 16% were aged 55-64, and 16% were over 65 years old. The majority of survey respondents (33%) reflected the median household income of Lower Mainlanders (Statistics Canada, 2017b), stating that their average household income was between $50,000 and $99,999. There was, however, a skew to above average income levels with a total of 51% of respondents stating that their annual household income was above $100,000.

The survey consisted of a variety of question formats including multiple choice, open-ended, and ranking questions. Ranking weighted scores were automatically
calculated by the SurveyMonkey software utilizing the following formula where “w” equals the weight of a ranked position, and “x” equals the response count for the respective answer choices (Survey Monkey, n.d.):

\[
\frac{x_1w_1+x_2w_2+x_3w_3+\ldots+x_nw_n}{\text{total response count}}
\]

The weights were then applied in reverse order when presented: the respondents’ most preferred choice (that which they selected as number one) has the highest weighted score, versus the lowest selected choice (that which they ranked in last position) being given a weight of one. As such, when referencing highest scoring weights throughout this document, it is to say that the statement in question was positioned the most times, on average, as being the top ranked option.

**Ethical Considerations**

The primary ethical issues that were taken into consideration are as follows: informed consent, confidentiality and anonymity of the participants, the use of the results, and honesty and trust (Oancea, 2016). Of utmost import was my adherence to BC’s Personal Information Protection Act: I received written consent for the collection of any personal information and provide details regarding the purpose and use of the information collected (BC Laws, 2019). The collection of survey data was completely anonymous; the only personal data collected was the names of the focus group participants via the consent forms they each signed. All consent forms are stored in a locked file cabinet, will be retained for no more than two years and then, per PIPEDA, deleted via shredding (Officer of the Privacy Commissioner of Canada, 2019). Both survey and focus group participants
provided informed consent that they freely chose to participate, with understanding that the results were to be used in master’s thesis with the ultimate goal of shaping ZEV communications.

**Research Findings**

**Content Analysis Findings**

As outlined in the methods section, my personal situation allowed me the unique lens of an in-market consumer researching ZEVs. Moreover, my special position dovetailed with and underscored the epistemological use of frame theory as foundational to my research as “frames are a means through which people attempt to understand unfamiliar and complex concepts through their own experiences and predispositions” (Peters et al., 2017). What’s more, because of the literature reviewed and referenced earlier, I was aware that advertisers’ use of frames have the capability for audiences to favour (or hinder) the adoption of pro-environmental behaviours (Altinay, 2017; Gifford, Kormos, & McIntyre, 2011; O’Neill & Hulme, 2009; Peters et al., 2017; Spence & Pidgeon, 2010; Whitmarsh & Corner, 2017). Using the temporal, manufacturer, and social media platform parameters outlined in the methods section, I scrolled through countless automotive and ZEV-oriented social media feeds, hoping to gain awareness of the ZEVs that were available to me as a consumer, and their specific features.

This cross-sectional experience as a professional marketer, consumer, and academic researcher highlighted that the auto-manufacturers and their local dealers’ dominant social media focus is their traditional line of ICE vehicles: overarchingly, there is limited social
media promotion allocated to ZEVs. Moreover, the images used of ZEVs are such that it is often not immediately obvious if the vehicles shown in social media photographs are electrically fueled. Of the images that I did determine to be promoting ZEVs, nearly half of them were not overtly visually presented as such, and relied heavily on the small amount of accompanying text available to social media advertisers to convey the message of offering a ZEV for sale. A shopper in the market for a ZEV, such as myself, would have to have a baseline of prior knowledge of ZEVs to be able to recognize a ZEV visually in social media advertising.

In my initial review of images of ZEVs of the brands’ and dealers’ social media feeds, as well as those from government organizations such as Emotive, the most consistent and obvious frame communicated was the existence of ZEVs as environmentally friendly alternatives to ICES. From a consumer perspective, alternate frames of how purchasing a ZEV could enhance my life (or even at its basest level, meet my vehicle criteria) were not immediately apparent. The advertisers were not capitalizing on the medium of social media, for a critical use of the visual medium focuses on what an image shows, how it is showing it and to whom, in order for the social effect of an image to be ascertained (Rose, 2016). This signified that the visuals being used in social media advertising were seemingly not addressing areas important to consumer questions and needs.

From here, a more substantive coding methodology was implemented in order to determine other thematic frames within the ZEV advertising visuals:

- which social media platform the ad was published on
- the advertiser
• the automobile make/model
• if text was included in the ad, and what it conveyed
• if human subjects were included in the photograph
• the environment/background of the visual.

These factors provided a foundational understanding of the various ZEV-photographically-based-ads on social media, and helped determine six key frames found within social media imagery of ZEVs.

• **Charging station.** Featuring a ZEV actively being electrically charged, or positioned very close to charging infrastructure.

• **ZEV decal.** Prominently displaying a button, technological graphic display, or external decal that promoted the vehicle as electrically fuelled and/or zero emission.

• **Green/nature.** Positioning the vehicle within a verdant natural environment featuring forests, trees, greenery, oceans, lakes, and/or mountain landscapes.

• **Urban.** Situating the vehicle within a glorified urban setting, highlighting it moving amongst traffic, bright lights and signage, tall, concrete buildings, visually synonymous with vibrant urban living.

• **Futuristic.** Highlighting the vehicle in a manner that positions it as from a new, different era, including insinuating the end of gasoline.

• **Showroom.** What I considered to be a more traditional dealership-style visual advertisement, featuring the vehicle within the dealer's showroom with other branding cues and logos prominently on display.
A number of images had multiple themes present within them, the most common being connectivity between the “Urban” and “Charging” themes. The images of a charging station often depicted a vehicle being charged within a cityscape. The theme applied to them in that case was whichever more overtly identified the vehicle as electrically charged. This resulted in these dually themed images, without exception, to be classified under the “Charging” theme, as, perhaps obviously, many vehicular-fuel-types operate in an urban setting, however ICEs cannot be electrically charged.

Images that reflected a multiplicity of themes were purposively chosen as part of the package of images that were to be discussed in the focus groups in order to help substantiate or refute my initial thematically framed inclinations through additional audience evaluation. One to three images from each theme were chosen to be representative of the theme in focus group discussions. In determining which images were to be presented and discussed in the focus group conversations, I selected the images that most appealed to me as a consumer: those that I could tell through the photograph met my aforementioned purchase criteria (though as will be expanded upon in the following section, those were few), those that highlighted the “electrification” of the vehicle and, what I considered to be, its inherent benefit for the environment. I also ensured that each of the aforementioned automotive makers were represented in the package at least once.
Exhibit 1: Images Shown in Focus Group Conversations Arranged by Frame

Frame: Charging Station
Images 1, 2, 3

Frame: EV Decal
Image 4

Frame: Green
Images 5, 6, 7

Frame: Urban
Image 8

Frame: Futuristic
Image 9, 10
Frame: Showroom
Image 11
Focus Group Findings

Focus group participants were led in a conversation about the determining factors in their decision to purchase a ZEV, followed by a review of the 11 images, featured in Exhibit 1, which were representative of the six key themes resultant from the previously conducted content analysis: Charging Station, ZEV Decal, Green/Nature, Urban, Futuristic, and Showroom. From this discussion, concerns and experiences germane to and indicative of the ZEV ownership experience revealed themselves. The adventitious discussions surrounding the ZEV ownership experience provided many salient touch points to the benefits of ZEV ownership, which ultimately heavily influenced the recommended frames for use in future image based social media advertising of ZEVs. As such, the details of these focus group conversations are outlined below.

The ZEV ownership reality.

One such area of discussion was the deciding factors that made the participants purchase ZEVs. Key among them was the environmental benefit: focus group participants felt that switching from traditional, fossil fuel emitting, internal combustion engine (ICE) vehicles to ZEVs greatly reduces the amount of GHGs and other pollutants in the air. While environmental factors played varying degrees as determining factors in their ZEV purchase – it was not ubiquitously the primary determining factor – every focus group participant recognized and acknowledged that they thought their ZEV purchase contributed to the betterment of the environment. Conversations surrounding ridding themselves of the guilt associated with burning fossil fuels, alongside a sense of pride for their pro-environmental
contribution through ZEV ownership were specific themes that were repeatedly explored throughout the focus group conversations. While the bulk of the discussion surrounding the environmental benefits of ZEVs had to do with the fact that they do not emit greenhouse gases, focus group participants highlighted other ways in which ZEVs offer a more sustainable alternative to ICE vehicles. Because ZEVs do not require the same level of service as ICE vehicles there are no pollutant materials, such as oil and filters, being thrown into landfills following routine maintenance checks. Additionally, it was noted how many auto manufacturers use recycled materials to build ZEVs and that the parts within the ZEV are themselves recyclable. Fundamentally, focus group participants bought ZEVs, and, subsequently take pride in them, as they are “clean” vehicles.

A secondary area of import amongst focus group participants when deciding to purchase a ZEV was government financial incentives and rebates. The fiscal rebates available from both the British Columbia and federal governments were “major factors” in many of the participants’ decisions to purchase their ZEVs when they did. Multiple participants spoke to how the vehicles would have been out of their price range were it not for the incentives, and thus when shopping for their ZEV limited themselves to only review vehicles that would qualify for the incentives.

A recurring thread in the focus group discussions was that the experience of driving a ZEV was pivotal in the decision making process to purchase one. Participants concurred that once they initially got behind the wheel of a ZEV they were sold on the product. The experience of driving a ZEV, as described by owners, is superior to that of a gas powered vehicle: audiophiles prefer it as there is no sound of a motor running to distract from their
music, the accelerator is more responsive and subsequently the driver feels an intuitively symbiotic relationship with the vehicle. A refrain amongst ZEV owner focus group participants was that ZEVs are simply more fun to drive than ICEs.

Focus group participants were also candid about some potential negatives of ZEV ownership and challenges they had as ZEV owners, as well as barriers they faced in becoming ZEV owners. The most ubiquitous of these obstacles was “range anxiety:” the worry that the ZEV’s battery will run out before drivers reach their destination. The anxiety stems from a perceived limitation of the driving range of electric batteries versus what people consider to be their daily car use, combined with concerns with the charging time of batteries and a perceived lack of charging infrastructure compared to traditional gas stations (Rezvani, Jansson, & Bodin, 2015). The participants stated that they understood the reality that very few individuals drive in excess of one hundred kilometres a day, but that there is a pervasive concern that ZEVs will not reliably be able to take their drivers to where they need to go and, due to a lack extensive infrastructure as historically seen with gas stations, that they will be left stranded. Various areas of the focus group discussion circled back to the notion of range, and how questions of range capabilities were deeply intrinsic to ZEV ownership. While it was not the central area of discussion, focus group participants touched on challenges regarding the limited amount of public charging infrastructure currently available in the Lower Mainland, the extent that they rely on their home charging stations (and concurrently issues surrounding obstacles for those living in condominiums to retrofit charging stations in their parking garages), and shared a sense of
hope for the proliferation of increased charging infrastructure in both the short and long term future.

Focus group participants also discussed lack of ZEV availability and inadequate levels of ZEV knowledge on behalf of automotive dealerships as obstacles to ZEV ownership. Participants concurred with assertions made in the aforementioned literature review regarding the realities of shortages of ZEV inventory available to British Columbians. They stressed the challenges regarding vehicles that fit within their price point, fit their needs in regards to size and range, and that were not on backorder. For example, one participant mentioned waiting close to a year to get the Kia Niro ZEV she wanted. Furthermore, focus group participants shared their experiences in communicating with sales associates at the dealerships. With the exception of Tesla dealerships (where all cars sold are electric), focus group participants discussed how their experiences in purchasing ZEVs demonstrated that automotive sales people have minimal knowledge about ZEVs. There were discussions surrounding why this may be the case, and focus group participants hypothesized that this was because, unlike at Tesla, traditional car dealerships (i.e. those that sell both ZEVs and ICE vehicles) are not properly incentivizing the sale of ZEVs both due to the lack of availability of ZEVs in general and because the dealers recognize that, due to the nature of ZEVs not requiring ongoing service, they will lose profit in the long term. Because of this, the consumer is left to do extensive research on their ZEV in advance of their vehicle purchase, and many focus group participants felt they knew more about the vehicle they were purchasing than the sales associate. Focus group participants suggested that the traditional model of commission-based sale of vehicles
would need to be re-evaluated for ZEVs in order to provide better customer service and subsequently the mass adaptation of ZEV ownership.

Moreover, focus group participants also felt that a lack of advertising limited their access to ZEV ownership. What one focus group participant detailed as a “severe lack of advertising” dovetails with the consumer’s need to do substantial independent research: consumers are not even aware of which automotive manufacturers have ZEVs on the market. Focus group participants predominantly could not recall experiencing any advertising for ZEVs in advance of purchase, whether via social or other forms of media. They noted the peculiarity of this, particularly in the age of digital media retargeting where entering search terms (which focus group participants stated was key to their independent research) and other online consumer actions typically result in the consumer being shown new advertisements relative to the content they are engaging with/researching. There was a general consensus amongst focus group participants that advertising had little to do with their decision-making process, and that self-driven motivators alongside word of mouth prompted them to do their own research. However, focus group participants were in agreement that dealers and auto-manufacturers (particularly those selling both ICE and ZEV models) should better promote their ZEV fleets in order to have ZEVs becoming more pervasive amongst British Columbians.

**Focus group review of ZEV social media imagery.**

The themes surrounding the deciding factors as well as the obstacles to ZEV ownership wove their way into the conversations surrounding the 11 social media
advertising photographs of ZEVs that the focus group participants were shown. The participants identified both ways in which the images did not resonate with them and highlighted aspects of the existing visual advertisements that accurately described their positive experience of ZEV ownership.

**Negative associations with current ZEV imagery in social media advertising.**

It was noted that the images of ZEVs reviewed did not present ZEVs as family friendly. As ZEV ownership in BC shifts out of the early adopter stage and into the mainstream (and by 2040 to the entirety of the population), it is important to recognize different consumer needs and to market these vehicles to individuals at various life stages.

The ZEV owners in the focus groups also took issue with images that did not accurately represent the realities of charging a ZEV. These types of images were a source of conversation about range anxiety. The images that featured a vehicle beside a charging station to which it was not plugged in, or that simply was a close up on the vehicle being charged, were not popular amongst focus group participants. The latter did not provide enough context to accurately represent ZEV ownership, but simply iterated a somewhat obvious fact that one has to charge their vehicle. The image of the vehicle not plugged into a charger was determined to be unrealistic and representative of poor ZEV ownership etiquette, something to which many focus group participants seemingly took great offence. Not utilizing a charger while parked in a designated charging area proved to be a great source of irritation for the focus group participants, who voiced concerns about the realities of a lack of public charging infrastructure currently available in the Lower Mainland, and British Columbia at large.
The most prevalent negative feedback that focus group participants gave was that they disliked images that did not explicitly feature the electricity of the vehicle. While ZEVs are becoming more pervasive on the streets of the Lower Mainland, they are still an anomaly (Axsen et al., 2019; British Columbia, n.d.; Smith, 2018), and the ZEV owners interviewed stressed that in order for ZEV adoption to rise, ZEVs need to be explicitly represented within advertising iconography. Owners referenced the design of the original “bug-eyed” Nissan LEAF and the unique profile of the suite of Tesla vehicles as “iconic”. Focus group participants felt these distinctive features classify ZEVs as different from their gas-fuelled counterparts. Images that accentuated this differentiation – by showing the vehicle charging, by highlighting the aforementioned iconic features of certain models or brands, by giving prominence to the vehicle’s electric range, and so on – were unanimously favoured amongst focus group participants over images that simply showed a vehicle in a neutral setting. One focus group participant particularly stressed the import: “The difference between...the Kia Soul powered by gasoline [and the] Kia Soul powered by electricity is between $15,000 and $20,000. Why are you going to spend the extra $20,000? What makes you want to buy that car?” Informing the consumer through visual cues that the vehicle they are seeing advertised is electrically powered, and in turn highlighting the benefits and positive attributes of ZEV ownership creates a better visual advertisement.

**Positive associations with current ZEV social media advertising imagery.**

In reviewing the selection of images used in social media advertising, focus group participants revealed that the photographs that most resonated with them were those that: showed ZEVs in a practical light as “normal” cars; that reflected an ZEV lifestyle of “fun”,

“fresh”, and adaptable to the unique desires and needs of Lower Mainlanders; that promoted ZEVs as environmentally friendly; and that demonstrated the extensive range that ZEVs have.

Focus group participants concurred that presenting ZEVs as normal, functioning vehicles that could easily and efficiently get drivers to any destination was the most important aspect to visually demonstrate in social media advertising. Focus group participants stated that the most poignant images were those that created an understanding that ZEVs basically operate in many of the same ways as traditional, gas-powered vehicles: ZEVs can fit into the general population’s current day-to-day lifestyle. Additionally, images that showcase the functionality of ZEVs as vehicles are supremely effective. By functionality, they were not referencing the mechanics or electrical wiring of the vehicle, but more so how ZEVs can seamlessly roll into mainstream life of the average British Columbian. While some focus group participants noted that they were intrigued and enthralled by ZEVs’ innovation and integration with other technologies such as mobile phones and charging networks, participants determined it to be more significant that images denote how ZEVs can function in the same manner as traditional ICE vehicles: ZEVs are not something of the future, they are for the here and now, and are practical for transporting families, commuting, road-tripping, etc. Ultimately, the focus group participants enjoyed images that underscored the perception of ZEVs as “normal” vehicles.

Furthermore, focus group participants noted an appreciation for photographs that portrayed owning a ZEV as part of an exciting, vibrant lifestyle. They spoke to the need for social media images to show young, energetic individuals enjoying having a vehicle that
had all the proverbial bells and whistles of cutting edge technology as well as the form and function of a reliable vehicle. Images such as the Hyundai Charging Station (Exhibit 1, Image 3) resonated with focus group participants as they appreciated the casualness of the individual featured in the image, along with the fact that it presented charging your vehicle as a clean, innovative, inviting, relaxing past-time: they interpreted the image as ZEV owners being able to synchronize their mobile phone with the charging station, while casually going for a 20 minute coffee in a café. While it should be noted, that as expanded upon when discussing range anxiety above, focus group participants noted that due to current infrastructure this sort of charging scenario is not always possible, however such photographic advertisements paint the ideal scenario of the public ZEV charging experience, and one that the focus group participants heralded as the paradigm for the development of more ZEV charging infrastructure.

Examining the theme of a fun ZEV lifestyle further, focus group participants particularly appreciated images that positioned ZEVs as being amenable to the type of active, outdoor-oriented lifestyle often associated with British Columbians, and Lower Mainlanders in particular. Images that showed ZEVs moving along coastal highways, and/or in amongst forest greenery were indicated as being particularly endearing to the focus group participants. Many of them spoke to how they would like to see more images of ZEVs reflecting the types of outdoor-oriented activities that Vancouverites typically do, providing examples such as driving the Sea to Sky Highway between Vancouver and Whistler, ZEVs outfitted with ski and bike racks, and pulling a surf board out of the back of a ZEV.
Focus group participants also appreciated images that promoted the vehicles as environmentally friendly alternatives to ICEs. They found that images that presented the vehicles in pristine natural environments conveyed a theme of sustainability and environmental friendliness. Not only did they think that presenting ZEVs as environmentally friendly would fit into the aforementioned ethos of Lower Mainlanders as nature-centric, but images that positioned ZEVs as the notoriously “green” choice compared to their gasoline-fuelled ICE counterparts were a point of pride for the focus group participants. Images that visibly showcase “zero-emission” (or other similar) decals were highly regarded amongst focus group participants as they reflected the clean energy ZEVs use. This was stressed even further when focus group participants lauded images that highlighted that gasoline was no longer needed. There was a consensus among participants who unanimously felt that gasoline is inherently correlative to fossil fuel burning and subsequently the degradation of our natural environment. Images that showcased “the end of gasoline” were described as clean, futuristic, pristine, lovely, and effective in drawing in the owner’s attention to the image. In particular, the Kia Soul ad (Exhibit 1, Image 9) was found to be especially intriguing and successful in communicating that gasoline would no longer be needed, and consequently, the environmental benefit of driving a ZEV.

As was seen throughout the focus group conversations, ZEV range was a common point of interest and focus group participants appreciated the advertisements that either expressly called out a vehicle’s range (i.e. through the addition of text) or inherently through visual cues (such as presenting an ZEV on a highway). The extreme prevalence of range as a topic of conversation amongst the focus group participants – it was described as
“crucial” to ZEV owners – speaks to the import of communicating this in the visual advertisements. Many of the focus group participants expressed positive connections to the images that accurately demonstrated the significant range that ZEVs have, as well as suggesting that the topic of range should be more prevalent and pervasive in all the visual advertisements they were shown.

Survey Findings

The survey consisted of four images of ZEVs. The featured images were selected based on the feedback from the focus groups: those that most resonated with focus group participants (images A, B, and C) as well as the one that least resonated with them (image D). This varied selection of images was chosen in the hopes to further substantiate the focus group findings regarding the most resonant images for ZEV social media advertising from a quantitative research perspective.

For each of the four images shown, the survey participants were asked whether they thought the vehicle was gas or electrically-powered, if they recalled seeing the image in their social media feeds, if the image elicited a desire to purchase the image shown, and if they thought purchasing the vehicle shown would contribute to combatting climate change. Survey participants were also asked to rank the degree to which they agreed with the following statements as they pertained to each of the four images: “this vehicle benefits the environment”, “owning this vehicle will make me look cool”, “owning this vehicle will save me money”, “I can get where I need to go in this vehicle”, and “owning this vehicle will be a benefit to my day to day life”.
Image A

This image was nearly unanimously (98%) understood to be a ZEV. The majority of respondents (64%) did not recall seeing it in their social media feeds. The most prevalent sentiment that survey respondents associated with this image was that the vehicle depicted within it would benefit the environment. The statement with the second highest weighted average was that owning the vehicle would make the survey respondents look fashionable and trendy. The image elicited generally positive potential purchasing reactions with 42% stating that upon viewing the image, they wanted to purchase the vehicle within it, while another 42% remained in a neutral position. Overwhelmingly, the general consensus (85%) was that purchasing the vehicle shown would result in the individual survey participant contributing to combatting climate change.

Image B

This image was the only one included in the survey that included overlaid text. It was relatively widely recognized as a ZEV with 80% of respondents
stating as such while, 18% were unsure if it was a ZEV or ICE vehicle, and 2% thinking that it was an ICE vehicle. Over 71% of respondents could not recall seeing the ad in their social media feeds. Sixty-six percent of respondents thought that purchasing this vehicle would benefit the environment. The majority of respondents (45%) were neutral in regards to whether this image made them want to purchase the vehicle, with 32% saying it did elicit a desire to purchase, and the remaining 23% stating that it did not.

**Image C**

Image C had slightly less success in overtly identifying itself as a ZEV, with 70% of respondents recognizing it as such, while 23% were unsure, and 2% considered it to be an ICE vehicle. Consistent with those figures, was that a lower number of respondents felt that the vehicle in the image could contribute to combatting climate change (63% agreed, 30% neither agreed nor disagreed, and 7% disagreed). Similarly, the image did not sell the vehicle to the same degree that others did, with 31% of respondents declaring that it did not make them want to purchase the vehicle.

**Image D**
Image D was the outlier amongst the group in that it was the least recognizable as a ZEV: only 32% of respondents thought it to be a ZEV, while 50% were unsure of the type of vehicle it was, and 18% believed it to be an ICE vehicle. Survey respondents were primarily impartial on the vehicle’s environmental impacts, with the majority (52%) declaring that they neither agreed nor disagreed with the statement that the vehicle could play a role in combatting climate change. In response to whether the image elicited the desire to purchase the vehicle, survey participants were evenly divided: 32% would consider purchasing the vehicle, while 34% of participants were undecided, and the remaining 34% did not feel moved to purchase the vehicle.

In regards to the ranking sentiments “this vehicle benefits the environment”, “owning this vehicle will make me look cool”, “owning this vehicle will save me money”, “I can get where I need to go in this vehicle”, and “owning this vehicle will be a benefit to my day to day life”, survey participants positioned Images A, B, and C in the exact same manner. First and foremost, the images elicited the strongest weighted average to the sentiment that the vehicle depicted would benefit the environment, with the thought that the vehicle would save them money coming in second. Participants ranked the notion that “I can get where I need to go in this vehicle” third, and “owning this vehicle will benefit my
day to day life” fourth. In last place for Images A, B, and C was the concept of the vehicle making them “look cool”, i.e. fashionable and trendy. It should be noted that the rankings did not parallel how the options were positioned in the questionnaire and that there was nuanced variables to weighted scores of each sentiment and image, thus limiting the likelihood that survey respondents were auto-populating their selections. Because, in reviewing other survey areas, images A, B, and C were also all overwhelmingly determined to be ZEVs and the majority of respondents concurred that the purchase of one would play a role in curbing climate change, it can be deduced that survey participants acknowledged other benefits to ZEV ownership while primarily correlating ZEVs with positive environment change.

When reviewing the ranking sentiments for Image D, all five sentiments were ranked relatively close together, with just a score of 1.24 separating the top and bottom ranked sentiments. The highest weighted sentiment was “I can get where I need to go in this vehicle”. While the statement “this vehicle benefits the environment” had the second highest weighted average score, 44% of respondents responded “Not Applicable” to this statement; this was also the case for the sentiment stating, “Owning this vehicle will save me money”. In the question preface, survey participants were given the option of including “Not Applicable” if they “completely [disagreed] with the statement.” Furthermore, the usage of the “Not Applicable” option was implemented to a much higher degree with Image D than the other three images: Images A, B, and C had a “Not Applicable” usage of between 1.7% and 24%, while across all five sentiment questions Image D had a “Not Applicable” usage rate between 26% and 44%. As noted above, this image featured a vehicle that was
the least identifiable as a ZEV, and this is supported by the respondents noting that this vehicle least aligns with the sentiments that elsewhere predominantly correlated with the positives of ZEV purchasing and ownership.

In addition to reviewing the specific images outlined above, the survey also asked questions regarding general priorities, desires, and considerations taken when purchasing a vehicle. The survey asked respondents to rank the most important factors to them when purchasing a vehicle. They positioned the factors, from most important to least important, as follows: price/up front costs, environmentally friendly, ability to transport one’s self/family, cost to operate, auto-manufacturer’s brand/reputation, and, finally, design features. It should be noted that the first and second positioned factors were relatively closely ranked, with the first having a weighted average score of 4.33 and the second a score of 4.14. The environmental impact of a vehicle was of further import to survey respondents, of whom 69% stated that being shown how a car can benefit the environment would increase their desire to purchase it. To this group of primarily ZEV enthusiasts, the environment was a noteworthy concern: when asked what role environmental issues, such as climate change and GHG emissions, played in the vehicle purchase decision-making process, 57% of respondents stated that it was a top priority (but not the most important), with 35% stating that it was indeed the predominant factor. Moreover, the survey respondents highlighted their enthusiasm for ZEVs, and their willingness to purchase, with 61% stating that there were ZEVs within their price range, and 67% agreeing that there are ZEVs that meet their personal or familial needs.
Results and Recommendations

The goal of the research was to determine the types of photographic stimuli used in social media advertising that best elicit the consumer behaviour of purchasing ZEVs. A foundation of social marketing practice for environmental sustainability is to address both the behaviours that are to be encouraged and those wanted to be discouraged: reduce barriers and increase benefits for the behaviour to be encouraged – in this case the purchase of an ZEV – and do the reverse for the opposing behaviour, i.e. buying an ICE (McKenzie-Mohr, 2011). Thus applying this principle, as well as the triangulated research findings of this study, it is recommended that images used in social media promote the ultimate adoption and sale of electric vehicles by reflecting contemporary reality of owning an ZEV: featuring the attributes that differentiate ZEVs from their gas-fuelled counterparts, while positively positioning ZEV ownership as an economic and ecofriendly lifestyle.

Clear positioning of ZEVs as discernably unique vehicles

In order to draw consumers to ZEV ownership through social media imagery, the vehicles need to be recognizable as overtly electrically powered. As demonstrated through my personal content analysis, and further substantiated through the focus group and survey research, the less overt the electric signifier, the less identifiable it is a ZEV.

The brand reputation of Tesla as a manufacturer of purely electric vehicles inherently ensures that when an individual sees a Tesla vehicle featured in their social media feeds they understand it to be an electric vehicle. The focus group participants heralded Tesla as an industry leader in the promotion of electric vehicles. Focus group
participants discussed what they felt to be a general understanding amongst Lower Mainlanders, and perhaps also within the greater Canadian, if not global, population, that Tesla vehicles are all electric. Because of this brand ubiquity, focus group participants thought that the use and propagation of images of Tesla vehicles in social media not only promoted the brand, but the electric vehicle industry on the whole. Tesla, then, is intrinsically linked to electric vehicle ownership and lifestyle.

How then can other brands compete with this culturally created symbiotic linkage between Tesla and ZEVs? Automotive brands that manufacture and sell both electric and gas-powered vehicles are competing with themselves, and seemingly, will opt to sell the vehicle that will yield the greater return on investment for them (Axsen et al., 2019; Le & Lindhardt, 2019; Smith, 2018). As noted by Clean Energy Canada (2018) and the Sierra Club (2019) reports and further substantiated during the focus groups, there are numerous issues facing automotive dealers ranging from vehicle availability, to a, seemingly, basic lack of product knowledge from dealers and salespeople, to the compensation structure of salespeople. The scope of some these issues surpasses the purview of this paper, however they are noteworthy to mention in demonstration of the systemic issues within the automotive and energy industries that hinder the sales of ZEVs. From a visual marketing standpoint, as more and more automotive brands will need to promote their fleet of ZEVs, it will become of even greater import to denote the differentiating features and benefits of ZEVs. For example, as noted by one focus group participant: why should someone buy an electric Kia Soul for $20,000 more than the gas-fuelled model?
Visual representations of ZEVs in social media must then overtly position any vehicle depicted as electric. The focus group and survey research demonstrate that the highlighting of decals promoting that a vehicle has minimal or zero emissions, and the inclusion of an easily discernable electric charging station are the primary correlative signifiers that the vehicle depicted within an image is electrically fuelled. Secondly, as determined through the focus groups, developing notable physical features of electric vehicles (such as the sleek, unique design of Tesla vehicles, or the “bug-eyed” Nissan leaf) and subsequently highlighting them in visual imagery helps to differentiate the vehicles as electric and therefore creates more impact when included in social media promotion.

**Make range anxiety a thing of the past**

As supported by previous academic research (Axsen et al., 2016, 2017; Ferguson, Mohamed, Higgins, Abotalebi, & Kanaroglou, 2017; Lane et al., 2018), and discussed in detail during the focus group sessions, the range of ZEVs, and subsequently range anxiety, is central to consumers determining whether they should purchase a ZEV. It would appear that, in actual fact range anxiety need not exist for ZEV owners within the Lower Mainland: focus group participants, the majority of whom were themselves current drivers of ZEVs, refuted range anxiety as part of their day-to-day lives. While there were conversations regarding challenges from limited public charging infrastructure, moreover they described the ease of driving ZEVs across the Lower Mainland, and elsewhere: being stranded after losing their charge was not of primary concern. Participants described how owning a ZEV improved their sentiments around commuting to and from work; some discussed doing
day trips to Whistler from the Lower Mainland (an approximately 250 kilometer round trip) on one charge of their ZEVs; others described taking cross-continental road trips and having easy access to charging stations at every pit stop. These sentiments were also supported by survey respondents who, when reviewing and ranking sentiments related to the various images of ZEVs, gave strong scores (ranging from 2.75 to 3.92) to the statement “I can get where I need to go in this vehicle”, even to those most overtly recognizable as ZEVs. The survey results confirmed that ZEV owners in the Lower Mainland are able to transport themselves as needed.

While focus group participants had mixed reactions to how range should be visually communicated – some supported the addition of text in imagery to convey exact range capabilities, while others were vehemently against it, stating that ads for ICE vehicles do not explicitly denote how far a tank of gas will transport you – there was unanimous support for the import of including visual messaging around range positivity. This was further substantiated by survey respondents who, when asked to rank the most important factors when purchasing a vehicle, put the vehicle’s ability to move oneself (and family) as needed – i.e. range – as the third most important determining factor. While there need not be unnecessary angst regarding range, it is still pertinent to the ZEV ownership lifestyle, and needs to be communicated positively within visual promotional imagery of ZEVs.

Moreover, as the technological innovation of ZEVs continues to evolve and battery life continues to improve, combined with the increased presence and mandates for charging infrastructure (Axsen et al., 2019, 2017; Axsen & Wolinetz, 2018; Peters et al., 2017), the notion of range anxiety need not exist at all. This can be further emphasized
through an accurate and nuanced representation of range in social media images. A graphic conversation of the vehicle’s range can be had without expressly delineating it textually by depicting vehicles in both rural and urban settings. Suggested examples that would particularly resonate within the Lower Mainland include a driver easily commuting in their ZEV in heavy rush hour traffic in the express lane (available to high occupancy, hybrid, and electrically fuelled vehicles); a ZEV, adorned with a roof rack and ski equipment, pictured on a snowy Sea-to-Sky Highway; or a ZEV traveling along the Sunshine Coast Highway with BC’s recognizable island seascape in the background. Ultimately, promotional social media images must create a visual narrative that communicates the ability of ZEVs to easily, ably, and efficiently take their drivers and passengers to everywhere any other type of personal use vehicle would be able to.

**Money talks**

All three areas of this research project, the researcher-conducted content analysis, the focus groups, and the survey, corroborated the import of vehicle price points, government incentives, and long-term cost savings to the decision-making and ZEV purchase process. As outlined previously, when initially conducting the jointly consumer/researcher lensed content analysis, vehicles that both met my price point and qualified for government cash incentives were a key parameter in my quest to purchase a new ZEV. I was not able to find any Facebook or Instagram advertisements that detailed (either visually or through accompanying text) the cost of the ZEVs I was being marketed, if it qualified for government funded cash rebates, or if said incentives were available at a
local dealer. The focus group discussion and survey results indicate that this experience is reflective of many others’ when conducting consumer research on ZEVs.

Similar consumer struggles were voiced during focus group conversations: the onus was heavily on the consumer to research how they could attain government incentives from which local dealership, and questions of pricing were not readily answered. Cash rebate incentives were, for many focus group participants, the deciding factor in regards to purchasing when they did:

“For me, the rebate amount [was] a major factor, not necessarily the greenhouse gases that you save. I’m emotionally attached to money. If you get the same car for paying less cash and drive without the [environmental] consequences of using gas, why not?”

“We just flat out couldn’t have afforded the vehicle if we hadn’t received the rebates that we did.”

“The rebates helped: when we realized what the rebates were at the moment, that helped pitch it because the price was stopping us. We were very nervous, and we still think: that’s the most we’ve ever paid for a car in our whole damn lives, and ever will, I think!”

Testimonials such as these were rather consentient amongst focus group participants, suggesting that rebate incentives are, at this stage, mutually dependent to ZEV purchasing as they make the vehicles more affordable. This was further validated through survey results: participants ranked the price and upfront costs as the most important factor when purchasing a vehicle.
Particularly in the Lower Mainland, where electricity costs remain comparatively low to elsewhere in Canada (Energy Hub, 2020), the cost to operate ZEVs is significantly less than their gas-fuelled vehicular counterparts (BC Hydro, 2020). This is piece of information is extremely pertinent to outline, particularly when considering the likely possibility that many British Columbians might, justifiably so, believe that ZEVs are simply luxury vehicles that are unaffordable for them. Though this does not alleviate the question of how these individuals might be able to afford the larger upfront costs of ZEVs, this belief could be stemmed by clearly outlining the actual long-term monetary savings to be had through ZEV ownership. Though survey respondents ranked operation costs as lower on their priority list of factors when purchasing a vehicle, it was still ranked in fourth (out of six) place with a solid score of 3.45. The reality of ZEV ownership, according to focus group participants, experts in the field, and energy focused organizations, is that one does indeed save a significant amount of money as ZEVs are inexpensive to operate: the cost to power the vehicle is lessened, and, without required oil changes and other regular servicing, maintenance costs are practically nil. The benefits of the cost savings of ZEVs were discussed at length among focus groups and many participants stated that the financial rewards were a primary advantage of ZEV ownership.

As evidenced by this research and further substantiated in McKenzie-Mohr’s (2011) seminal text on sustainable marketing, financial incentives and cost savings are important components of social marketing strategy. Better communicating how ZEVs save their owners considerable money, both off the purchase price and long term maintenance costs, could improve adoption of ZEVs and encourage more individuals to change their
purchasing behaviour. Admittedly, figures and numerical incentives are challenging to convey through photographic visuals alone. Photographic images have a limited ability to convey detailed information such as cost incentives and annual savings, and thus this may be a limitation of visuals that can be effectively used in social media advertising. Given the results of this study however, it is evident that communicating the monetary savings is pertinent to and effective in promoting ZEV ownership and lifestyle. Therefore to include information regarding cost savings in promotional material, it is recommended to accompany any photographic imagery with textual elements clearly outlining the extent to which ZEVs save money: for example including a simple chart stating the average cost to operate an ICE vehicle annually and the same yearly operating costs for an ZEV.

**Go for the Green**

Within the Lower Mainland, and the province of British Columbia on the whole, there is a relatively high respect for and understanding of environmental issues compared to elsewhere in Canada (Angus Reid Institute, 2019; Bricker, 2019). There is a general understanding that ICE vehicles contribute to greenhouse gases and are pollutant to our natural environment versus ZEVs that have been positioned as a sustainable, ecofriendly alternative to ICE vehicles (Rezvani et al., 2015), and, as evidenced through the focus group and survey research conducted in this study, there is an inclination for ZEV owners and enthusiasts in the Lower Mainland to both consider themselves to be pro-environmental
and take action to benefit the environment. Moreover, ZEV owners strongly associate their vehicle with being a proverbially green choice.

The focus group research demonstrated that social media images that position ZEVs as environmentally friendly alternatives to ICEs are effective at communicating sustainability messages: those interviewed expressed that images with the vehicles positioned in pristine natural environments conveyed pro-environmental themes, which resolutely resonated with the majority of survey participants. The utilization of imagery depicting clean, verdant natural surroundings in visual automotive advertisements is, of course, not unique to the promotion of ZEVs; one need only flip through practically any newspaper or magazine, or scroll through basically any automotive brand’s social media feeds to see imagery of ICE vehicles situated within a lush, green environment. The use of this “green” frame, and its recognized existence in other visual advertisements is beneficial to ZEV brands and advertisers; for, in order to effectively tap into the cognizance and emotions of its intended audience, the introduction of a new visual cue or frame must make sense in terms of the existing system of frames (Lakoff, 2010). The “green” frame takes advantage of established schemas in visual advertising for vehicles, and has the potential to intensify and reinforce the validity of such a frame where electric vehicles are concerned.

During qualitative research discussions regarding the deciding factor to purchase their ZEV, owners most cited wanting to benefit the environment, however as previously discussed, it was to varying degrees of import. The positive contribution that driving a ZEV makes to the environment is important to ZEV owners, but in some cases is viewed as a tangential benefit when compared to personal fiscal savings. This was further
substantiated by survey results where 57% of respondents stated that the environment plays a significant role in their vehicle decision-making process, but not the most important. Comparatively, when asked to rank the most important factors when purchasing a vehicle, the majority listed the cost as their priority. That said, 69% survey respondents also stated that being shown how a vehicle could benefit the environment would increase its purchase desirability.

The ZEV owners interviewed and surveyed within this study are in the early adopter stage of social diffusion. In order to transition to the province’s stepped goals of 100% of new car sales by the year 2040, there needs to be a considerable shift in adoption to attain the next stages of social diffusion: early majority and late majority. Douglas McKenzie-Mohr (2011) states that, particularly for the application of social diffusion to issues of sustainability, highlighting the relative advantage of a behavioural change and its compatibility with the values of the target audience are two areas that prove to be successful in progressing the diffusion of innovation. Pairing this with theories on visual communication by understanding that the manner in which audiences see an image is just as important as the image itself (Rose, 2016), an effective methodology to simultaneously communicate ZEVs’ environmental benefits and speak to consumers’ desire for green products would be positioning ZEVs in visual imagery that highlights pristine, natural environments. Images that pair the ZEV with fresh, verdant, natural landscapes visually infer the environmental benefits that will come from the reduction in greenhouse gases being emitted by ICE vehicles, while being compatible with the values of the target
audience of Lower Mainlanders who, seemingly, value the environment and their ability to interact positively with their natural environment.

**Conclusion**

My research question and my methodological approach encompassing pragmatic and interpretative epistemologies were ideal candidates for mixed methods research: they acknowledge, embrace and ultimately seek to find different social and conceptual ways of knowing. Such methodology has been successfully used in other research projects surrounding climate change communications, and was purposefully chosen to in order to be able to make empirical and actionable recommendations for climate change communications. Such practically minded goals can be accomplished by recognizing that various types of data shape knowledge and understanding, and therefore help make a more meaningful impact.

My use of a mixed methods approach was grounded in the ideal that the results of my research needed to be substantiated in both the scientific and communications communities/industries, and was justified by the connection between my research question, the methodological research design, and my theoretical foundation in frame theory. Through the use of a qualitatively focused, sequential mixed methods approach, I was able to more adeptly address the complex and nuanced question of which social media visuals best reflect ZEV ownership, and can change behaviour as it pertains to British Columbians’ purchasing of electric vehicles.
One of the limitations of my mixed methods approach was, as noted in the methods section, the relatively low response rate on the survey, thus providing quantitative data that is not statistically representational of the general popular. Despite it’s statistically unviable nature, the survey data serves as a vector of triangulation alongside the qualitative research and the literature referenced. The survey provided an opportunity to discuss the visual frames at play outside of the focus groups, through what could ultimately be considered as an additional series of “mini interviews.” Moreover, this intial survey can serve as a justification for the need, and as a starting point, for further quantitative studies in order to gain more definitive, statistically viable, deductive, empirical data on this topic.

The recommendations made are indicative of the triangulated research findings. How qualitative and quantitative data are integrated is typically thought to be of utmost importance in order for the research to make meaningful conclusions (McCrudden & McTigue, 2018; V. L. Plano Clark, 2017; Uprichard & Dawney, 2019). This can at times be difficult to achieve if the results of the quantitative and qualitative portions of the research are at odds with each other (Bryman, 2008). However, if mixed methods research is being used purposefully to uncover answers to complex issues, such as behavioural changes as they relate to climate change mitigating purchases, than it is understandable – and perhaps even expected – that the data yielded by the research would be complex in and of itself, and ultimately may not be able to seamlessly integrate (Uprichard & Dawney, 2019). Complementary findings, such as unearthed through the content analysis, focus groups, survey conducted, yield more substantive research outcomes as they offer a holistic view
on the social phenomenon in question and provide deeper insight into the multiplicity of its components (Uprichard & Dawney, 2019; Viswanath et al., 2013).

Such an understanding that integration cannot always occur seamlessly is also present in Nastasi, Hitchcock and Brown’s suggested methodological framework of synergistic typology for mixed methods research wherein an emphasis is made on the cyclical nature of research (a feedback loop between qualitative and quantitative data), and its complex “application to real-world problems” (2010, p. 329). This highlights the benefit of using mixed methods when approaching more complex questions of behavioural phenomena, such as the purchasing of ZEVs. One such complexities is evident in the seemingly contrasting research findings of the need to position ZEVs as overtly electrified and unique from their ICE counterparts, and the necessity to communicate that ZEVs are passenger vehicles that can provide the same transportation benefits as “normal” cars. Though they have the potential to be mutually exclusive, the suggested frames could indeed be communicated as linked, by removing the reference to ICEs completely: ZEVs are unique vehicles, that can be conveniently electrically charged and transport their passengers wherever they need to go. By recognizing the multiplicities of issues currently at play in the adoption of ZEVs, the completed research recommendations can help inform how communications professionals will need to consider and look at such differences when creating their marketing strategies surrounding messaging of ZEV purchasing, while also serving as a catalyst for additional research to continue and build upon the aforementioned feedback loop.
As indicated in the existing academic literature referenced throughout this thesis, and further substantiated by my research, there are many hurdles to the mass adoption of ZEV ownership in the Lower Mainland. As referenced and outlined previously, most prominent among them are vehicle price points and affordability, availability of government incentives, charging infrastructure, vehicle availability, dealer knowledge about ZEV products, and a diversity of vehicle models to reflect the various needs and uses of vehicular ownership. As the province of British Columbia develops and enacts its legislation to have 100% of vehicle sales be electric by the year 2040, there will be a need to promote the benefits of ZEV ownership to encourage individuals to purchase them. How to face all these challenges, and promote the benefits of ZEVs in a social media image? Is, as the old trope goes, a picture worth a thousand words?

As referenced throughout this paper, a theoretical approach encompassing the areas of framing, social semiotics, and audiencing is beneficial to understanding the thematic nuances to effectively communicate ZEV ownership. The application of meaning to visuals by involving specific social cues from imagery in specific contexts (Rose, 2016) to images of ZEVs used in social media advertising provides a framework that increases the effectiveness and resonance of the promotional images themselves. Ultimately, the meanings of visual images as they pertain to mass communications strategies to elicit behavioural change will rely heavily on both individual and collective forms of knowledge being understood by those creating the visuals (in this case automotive brands). By incorporating this sort of theoretical framework into the methodology of my research I demonstrated how a similar approach could be utilized by those crafting the
communications plans that I ultimately hope to affect: an understanding of visual theoretical methodologies will assist marketers in disseminating visually based advertisements that fit the context of the media landscape in which they are being viewed. The results of this research suggest that the implementation of framing social media visuals as reflective of a positive ZEV lifestyle in social media ads can better resonate with consumers wishing to emulate said lifestyle, with the desired end goal of increased purchases of ZEVs.

Given that we are still within the early adopter stage of the diffusion of innovation model (Axsen et al., 2016), social media images on their own cannot singularly sell a ZEV. They need to work within a greater conversation, including advertising discourse and public policy, to paint a positive picture of the ZEV lifestyle by illustrating how they can save owners money and be reliable, trustworthy vehicles, whilst benefiting the natural environment.

These parameters are a strong first step in determining the most effective visual imagery to be used in social media promotion. It is recommended that future consumer-oriented research be conducted by automotive brands and their dealerships, and/or by commercial and government agencies promoting the adoption of ZEVs, by utilizing social media sites’ existing functionality of pixel usage and A/B image testing, to definitively see which types of images yield higher click through engagement rates and sales conversions.

Given the attention that was given amidst focus group participants to range and range anxiety, it is suggested that further research be conducted in to how best to communicate the ability of ZEVs to smartly transport people and goods. As charging
infrastructure continues to grow throughout the Lower Mainland, and conversations around electric charging become increasingly pervasive, it stems to reason range anxiety will become of decreasing import. If the results of this study are taken into consideration and images expressing positive positioning of range are incorporated into social media, and other visual promotional material, further research could indeed be conducted into the correlative effects that favourable visual conversations about range have on whether, combined with the increase of infrastructure, the topic of range anxiety decreases.

Ultimately, consumers must understand that ZEVs can readily and ably fit the needs of their every day life, while providing additional benefit to them personally through cost savings, and to the world on the whole by diminishing environmental impact. An effective and robust depiction of a positive ZEV lifestyle can be achieved by utilizing promotional images that show easily identifiably electrically-fueled vehicles, that can transport people and goods any and everywhere, and by positioning vehicles adjacent to the pristine natural environments. Government agencies, auto manufacturers, and pro-environmental groups would be encouraged to consider the results of this research as they develop their communications strategies to promote the purchase of ZEVs, allowing them to maximize the reach and impact of their efforts. A consistent and widespread use of these visual frames in social media promotion will begin to shift consumer consciousness to ZEVs by succinctly promoting the most advantageous aspects of ZEV ownership, while creating a recognizably ZEV-specific iconography.
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Appendix A

Questions for Focus Groups

The purpose of this study is to answer the following question:

What types of photographs utilized in social media advertising from the BC government, automotive manufacturers, and pro-environmental groups promote behavioural change resulting in the purchase of zero-emission vehicles (ZEVs)?
1. What was the deciding factor for you to buy an EV?
2. Who/what are/were the primary influencers to make the decision to buy an EV?
3. How pervasive is social media in your daily life? Would you consider yourself a regular user of social media?
4. In reviewing each of these images in the attached document:
   a. What does this image make you think of?
   b. How does this image make you feel?
   c. How does this image relate to EV ownership?
Appendix B

Questions for Survey – EV Purchasing and Images Used on Social Media

• Do you live in the Lower Mainland?
  o Yes
  o No

• Have you purchased a new vehicle in the past year, or are you currently in the market for a new vehicle?
  o Yes
  o No

• Did you purchase an electric vehicle (includes battery operated and plug-in hybrid electric vehicles) in the past year, or do you intend on purchasing one in the coming year?
  o I purchased one in the past year
  o I plan to purchase one in the next year
  o No, I don’t own an electric vehicle and don’t plan on buying one

Please look at the attached photograph that was used in a social media advertisement promoting the purchase of an electric vehicle. Please answer the following questions in regards to this image. (NOTE: question repeated four times for images A through D)

• Do you recall seeing this image in your social media feed? Yes or No

• Please rank, with 1 being the most to 9 being least what this image makes you think of, or note “None of the above”:
  o Owning this vehicle is a benefit to the environment
  o Owning this vehicle will make me look cool
  o Owning this vehicle will help climate change
  o Owning this vehicle will save me money
  o I can get where I need to go in this vehicle
  o Owning this vehicle will cost me a lot of money
  o Owning this vehicle will be a benefit to my day to day life
  o Owning this vehicle would not change my day to day life
  o Owning this vehicle is not an option for me
  o None of the above

• For each of the listed statements below, please check the one response that best expresses the extent to which you agree or disagree with that statement
  o This image makes me want to purchase the vehicle shown in it
    ▪ Strongly disagree
    ▪ Disagree
    ▪ Neutral
    ▪ Agree
    ▪ Strongly Agree
This image reflects a positive image of the environment and our natural surroundings
  ▪ Strongly disagree
  ▪ Disagree
  ▪ Neutral
  ▪ Agree
  ▪ Strongly Agree

If I were to purchase this vehicle, I would be doing my part in combating climate change
  ▪ Strongly disagree
  ▪ Disagree
  ▪ Neutral
  ▪ Agree
  ▪ Strongly Agree

Additional questions not associated with any images
  • What are the most important factors to you when purchasing a vehicle? List with 1 being the most important and 5 being the least important
    o Price
    o Brand
    o Environmentally friendly
    o Cost to operate
    o Looks/design/style
    o Ability to move you/your family as needed

  • Do the issues of climate change and other environmental concerns come you’re decision making process when making vehicle purchases?
    o Yes, definitely
    o Somewhat, but it’s not the most important factor
    o Not at all

  • Would being shown how a car benefits the environment make you want to purchase it more?
    o Yes, definitely
    o Maybe
    o Not at all

  • Do you think that there are electric vehicles available in British Columbia that are within your price range?
    o Yes, definitely, there are many choices
    o Maybe, there are a few choices
    o There are no electric cars available in BC that fit my price point

  • Do you think that there are electric vehicles available in British Columbia that meet your needs/the needs of your family?
    o Yes, definitely, there are many choices
    o Maybe, there are a few choices
There are no electric cars available in BC that fit the needs of my family

- Is there any other information that you would like to share regarding purchasing or owning electric vehicles?

Demographic Information
- What is your gender
  - Male
  - Female
  - Non-binary
  - Prefer to self describe______________
  - Prefer not to say
- What is your age range
  - 18-24
  - 25-34
  - 35-44
  - 45-54
  - 55-64
  - 65+
- What is your household income level
  - Under $50,000 per year
  - $50,000-$99,999 per year
  - $100,000 - $149,999 per year
  - $150,000 - $199,999 per year
  - $200,000 and above