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Published in:
Energy Policy

DOI:
10.1016/j.enpol.2022.112883

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2022

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):

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Distributional concerns and public opinion: EV subsidies in the U.S. and Japan

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ABSTRACT

This paper explores whether perceptions about distributive inequity shape public support for energy transition policies. The introduction of electric vehicles (EVs) is an important policy priority for the decarbonization of road transportation. Because high sticker prices restrict EV sales, governments offer consumers EV subsidies. However, some are concerned that subsidies may favor certain groups and industries. Using a conjoint experiment, we examine the public preference for EV subsidies in the U.S. and Japan. In the U.S., there is a concern that EV subsidies help the high-income (i.e., individual-focused concerns), while the prevailing concern in Japan is whether they favor foreign companies which are the first movers in the EV industry (i.e., industry-focused concerns). We embed a vignette experiment within the conjoint experiment to prime the respondents with individual- and industry-focused distributional concerns. In both countries, regardless of the priming they received, our respondents favor universalistic subsidies that are inclusive of the high-income and luxury/foreign cars to subsidies that are more progressively targeted (i.e., exclusive of the rich and luxury cars) or favoring domestic firms. As such, recent EV policy discourse centering on distributional politics does not appear to reflect public opinion.

ARTICLE INFO

Keywords:
EV subsidy
Public opinion
Distributional politics
U.S.
Japan
Experiments

1. Introduction

Climate change is one of the most pressing global problems today, with the road transportation sector alone contributing to 14.4% of total global CO₂ emissions in 2019 (International Energy Agency, 2020). Within this sector, personal automobiles with internal combustion engines (ICEs), which typically run on gasoline or diesel, contribute to about 60% of these emissions. Thus, in conjunction with switching to renewable sources for electricity generation, the replacement of ICE automobiles with electric vehicles (EVs) has emerged as an important policy priority in a number of countries. However, the transition to EVs poses several challenges, especially their high sticker price compared to ICE vehicles (Breetz and Salon, 2018; Holland et al., 2021). To overcome the price-point issue, many governments offer subsidies to encourage households to purchase EVs and other eco-friendly vehicles.¹

EV subsidies, however, have generated controversy over distributive fairness because they may be perceived as favoring some groups and industries over others (Sovacool et al., 2019). These fairness concerns involve multiple dimensions, such as who should receive these subsidies, how much they should receive, and for what types of cars, though these distributional concerns over EV policy may differ between countries. For example, in the U.S., the primary concern has been whether EV subsidies predominantly favor the rich, who can readily afford to purchase EVs. A report by Congressional Research Service indicated that 78% of those who received EV tax breaks in 2016 earned over $100,000 annually (Sherlock, 2019). This is why critics view the $800,000 income

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¹ While we recognize that there are other problems associated with EV uptake, including the availability of charging stations, which generates range anxiety for EVs, this study focuses on subsidies that reduce the purchase price rather than the operating costs for consumers. Liao et al.’s (2017) review of 26 empirical studies on EV preferences, for instance, finds that policies targeting operating costs such as free parking and toll reduction “are not significant in any of the studies that explored their effects” and that “the effectiveness of giving EVs access to HOV [high-occupancy vehicle] lanes remains ambiguous.”

https://doi.org/10.1016/j.enpol.2022.112883

Received 2 November 2021; Received in revised form 21 February 2022; Accepted 23 February 2022
Available online 4 March 2022
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threshold for households to qualify for EV subsidies in the $3.5 trillion budget proposal as climate welfare for the rich.²

In Japan, the EV subsidy debate revolves around which low-emission cars should be eligible because, even though they have been the first movers in hybrid technology, Japanese automobile firms are laggards in the EV industry. The distributional concern is that a subsidy policy focused on EVs but excluding hybrids or plug-in hybrids might favor foreign firms over domestic ones. In fact, if Japanese consumers switch over to EVs too quickly, Toyota President Akio Toyoda argued that “the current business model of the car industry is going to collapse” (Dooley and Ueno, 2021). Thus, in both countries, the EV subsidy debate tends to reflect distributional concerns.

Given the substantial budgetary support required for EV subsidies, it is vital that there is significant public support for specific policy designs. Our paper explores the EV subsidy design preferences of the public in relation to country-specific distributional concerns. By doing so, this paper responds to the emerging climate policy literature that has suggested that the key impediments to climate progress are not concerns about free-riding by other countries (Ostrom, 2010) but domestic distributional concerns about which industries win and which lose in the process of decarbonizing the economy (Newell and Mulvaney, 2013; Aklin and Mildenberger, 2020; Dolsak and Prakash, 2022).

Our empirical analysis consists of four steps. First, we formulate a hypothetical EV subsidy package consisting of seven eligibility dimensions: (1) income threshold, (2) car retail price, (3) domestic versus foreign carmaker, (4) EVs only or EVs in addition to hybrids and plug-in hybrids, (5) level of incentive per car, (6) type of incentive, and (7) trade-in requirement. These eligibility dimensions asymmetrically distribute benefits across groups and can potentially lead to distributional concerns. To explore public preferences for EV subsidy policies with different eligibility-related features, we conduct a conjoint experiment.

Second, to assess whether there are between-country differences in public preferences for specific eligibility dimensions, we use an identical conjoint design in the U.S. and Japan, two countries where the EV subsidy debate centers on different distributional concerns. Third, we seek to prime respondents for specific distributional concerns using vignettes emphasizing either an individual-level concern (high income versus low income, which is more prevalent in the U.S.) or an industry-level concern (domestic versus foreign firms, which is more prevalent in Japan). In both countries, just before the conjoint experiment, one-third of the respondents are exposed to the individual-focused vignette, another one-third are exposed to the industry-focused vignette. The remaining one-third are not exposed to either vignette (the reference category). This design allows us to explore variations in public support for EV policy design within and between the U.S. and Japan when respondents are exposed to specific distributional concerns. Fourth, we examine the heterogeneous effect of the individual eligibility dimensions depending on the individual characteristics of the respondents, such as their income and party affiliation.

Our findings are surprising given the recent debate emphasizing domestic distributional issues as key barriers to climate policy (Newell and Mulvaney, 2013; Aklin and Mildenberger, 2020; Dolsak and Prakash, 2022). First, we find that both American and Japanese respondents prefer policies that are universalistic in nature (i.e., no eligibility restrictions) to progressively targeted subsidies that favor the low-income households and non-luxury cars or selective subsidies that favor domestic firms. While this universalist support is stronger among higher-income respondents, it is also observed among lower-income respondents. Despite the differences in the EV policy discourse surrounding the targeting of EV subsidies (and other macro-level contexts) in the U.S. and Japan, we find surprisingly similar preferences between American and Japanese respondents regarding specific dimensions of the EV subsidy package. Second, even with the introduction of the vignettes, which prime the respondents for different distributional issues, support for specific policy dimensions does not change for the respondents in the treatment groups. Despite the priming, respondents in both countries consistently exhibit a strong preference for universalistic subsidies.

Third, we expected that individuals with specific characteristics would prefer certain types of EV subsidy packages; for example, high-income respondents should oppose income thresholds for EV subsidies. However, many important individual characteristics such as education, eco-friendly vehicle ownership, attitudes towards environmental issues, and party affiliation do not mediate the preferences of the respondents for the dimensions in a subsidy package. In particular, the lack of influence of party affiliation in the U.S. is important because previous studies have found that climate change is a partisan issue (Birch, 2020; Craz, 2017). This raises the broader question of whether the salience of partisanship varies between types of climate policy and, if so, whether this can be used to find common ground on these issues.

Overall, our results suggest that the elite-level discourses over the distributional effects of EV subsidies do not reflect the mass-level preferences over the policy, and policy-makers should be aware of the elite-public gap over EV subsidies if they want to accelerate the transition to emission-free vehicles.³


³ In our research, elites refer to policy elites and business elites. According to Skrentny (2006: 1765) “policy elites” are state actors (e.g., members of Congress) who have some influence over policy making, and business elites (e.g., automobile industry leaders) are those with privileged access to policy elites and seek to convince policy elites to enact their wishes.

² In the U.S. context, two EV subsidy debates are of importance. Starting 2010, the first debate focused on the U.S. Congress placing a limit on the number of EVs a company could sell to avail of the federal tax credit (up to $7,500 per car). Specifically, the federal tax credit was to be phased out once the company had sold 200,000 cars (in total). Since Tesla was the only major player in the EV market, it hit the 200,000 ceiling in 2018. However, some EV critics noted that Tesla does not deserve subsidies because it makes luxury cars. The second debate is more recent, focused on the stalled Build Back Better Bill. Tesla has managed to get the 200,000 EV limit removed. However, another distributional conflict has emerged. In the House version of the bill, the federal government will provide a tax credit of $7,500 on all EVs and an additional tax credit of $4,500 for cars produced in unionized factories, Republican Senators and Senator Joe Manchin (D-WV) have objected to the preferential treatment being given to union-produced EVs. Most automobile plants outside the Midwest (many of which have been established by Japanese, Korean, and Chinese companies) are nonunion shops (these are also called “right-to-work states because they put impediments to unionization). Indeed, the Toyota factory in West Virginia that Senator Manchin is worried about is a non-union plant. Moreover, the union versus non-union workforce issue is also a proxy war between the traditional American Companies (though Chrysler is now owned by Fiat) which tend to be located in the Midwest, and the Japanese companies (and Korean and German companies such as Mercedes-Benz and Hyundai with factories in Alabama) which tend to be located in the South. Finally, Tesla also opposed the union provision because its workforce is not unionized.
Citizens are bombarded with information on a range of issues every day. Given this information overload, the nuances of various policy debates may not be reflected in surveys unless the respondents are primed (Kesper et al., 2019). We thus embed a vignette experiment within our conjoint experiment by randomly exposing respondents in both countries to the specific framing of two distributive concerns over EV subsidies: 1) how the incentives might favor high-income households over others (i.e., an individual-level concern) and 2) how the incentives might favor foreign over domestic firms (i.e., an industry-level concern). The control groups in both countries are exposed to neither vignette.

If the country-specific EV debate influences respondent preferences for EV policy design, we expect American respondents exposed to individual-level framing (i.e., EV subsidies may favor affluent households) to more strongly support subsidies that favor low-income households compared to the control group. We also expect industry-framing to resonate less with U.S. respondents, thus the treatment effect will be relatively weak. Following the same logic, Japanese respondents exposed to industry-level framing (i.e., EV subsidies may favor foreign firms) should show support for policy dimensions that privilege domestic automakers, while individual-level framing should resonate less with Japanese respondents. Table 1 summarizes our expectations for the treatment groups in comparison to the control group by country.

### 3. Survey design

We recruited respondents through Qualtrics to answer an online survey in the U.S. and Japan. The surveys were administered between April and May 2021. The survey in Japan was conducted in the Japanese language. One of the co-authors is a native speaker and this ensured that the survey language was clear and culturally appropriate. The sample sizes were 1,579 for the U.S. and 1,748 for Japan. We distributed a pilot survey (n = 200 for each country) to ensure that the respondents correctly understood the questions. Following Aronow et al. (2019), we added two attention-check questions to ensure the quality of our survey responses; we discarded from the sample those respondents who failed these attention-check questions. The human subject protocol for the research was evaluated and approved by the ethics committee at the University of Washington (STUDY00012176). Our pre-analysis plan is registered at Open Science Framework (OSF). Table A1 in the Appendix shows comparisons between the general population and our samples.

#### 3.1. Conjoint experiment

In recent years, conjoint experiments have become more widespread in academic research. Unlike traditional surveys, in which participants respond to one dimension at a time, conjoint experiments lead respondents to simultaneously examine multiple dimensions of policy design (Hainmueller et al., 2014). Consequently, conjoint experiments can mitigate social desirability bias because the respondent can choose politically unpopular dimensions without revealing this to others. This is a crucial issue in our study because the subject of distributional equity can be politically sensitive, and some respondents may be less forthcoming about their true preferences as a result. In the case of EV incentives, other scholars have also used conjoint experiments and explored how consumers’ willingness to purchase EV is shaped by the presence of incentives (Ko and Hahn, 2013; Helveston et al., 2015; Lieven, 2015) and which type of incentives (e.g., charging, driving, registering, purchasing) the public prefers (Li et al., 2020).

In our conjoint experiment, respondents are given the descriptions of two hypothetical policy pairs and asked to choose between them. Each policy has seven dimensions: (1) income, (2) car retail price, (3) carmaker eligibility, (4) type of vehicle, (5) level of incentive per car, (6) type of incentive, and (7) trade-in requirements (Table 2). Respondents evaluate five pairs of policy proposals in total, with the setting for each dimension varying randomly between different paired comparisons.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Expectations for treatment groups.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Vignette 1: Individual-level distribution concerns</td>
</tr>
<tr>
<td>Associated Eligibility Dimensions</td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>Income, Car Retail Price</td>
</tr>
<tr>
<td>US</td>
<td>Higher favorability for means-testing and restrictions on the retail price</td>
</tr>
<tr>
<td>Japan</td>
<td>Weak or no treatment effect</td>
</tr>
</tbody>
</table>

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5 In Japan, EV subsidies have been available but compared to the U.S., there was relatively little debate over how EV subsidies disproportionately help the high-income. This is partly due to the fact that Japan is a front runner of hybrid cars and lags behind in EV production—the share of EVs accounts only for 1% of overall sales cars in Japan (https://www.japantimes.co.jp/news/2022/01/11/business/corporate-business/tesla-japan-import-ev-sales/). However, since around 2021 when the government of Japan announced its plan to eliminate gasoline-powered vehicles by 2035, it created some controversies mostly among Japan’s auto industry. Akio Toyoda, the current president of Toyota as well as the chairman of the Japan Automobile Manufacturers Association, an industry group that all major Japanese auto companies belong to, responded to the plan saying that a hasty switch to EVs can cost employment in the industry, which employs about 5.5 million workers (https://www.reuters.com/business/environment/japans-car-lobby-says-it-can-load-drive-carbon-neutrality-2021-04-22/). In the meantime, the government recently increased EV subsidies up to a maximum of 800,000 yen, but customers can benefit from the full amount subsidy only for an EV type that equips with a power system that can also be used for an emergency power supply and/or for the power supply of homes and home appliances for outdoor activities, which non-Japanese EVs tend not to have.


7 While Americans oppose trade-in requirements, Japanese respondents seem indifferent to this policy dimension. This may in part be because trade-ins are less common in Japan.
3.2. Vignette experiment

Our conjoint experiment nests a vignette experiment. For each country, we randomly divide respondents into three groups. The two treatment groups receive priming about 1) how EV subsidies may favor affluent households over others or 2) how EV subsidies may favor foreign over domestic firms. The control group receives neither of these primers. All of the respondents first read the following passage:

“Climate change is an important global problem. Cars that run on gasoline and diesel contribute to much of greenhouse gas emissions in the transportation sector. To lower these emissions, the government is considering providing incentives for households to buy low or zero emission cars such as hybrids, plug-in hybrids, and electric vehicles.”

Respondents are then randomly assigned to one of the three groups. The first treatment group reads the following vignette:

“How, however, worry that the incentives favor wealthy households over poor households as hybrid, plug-in hybrid, or electric vehicles are still expensive.”

Respondents in the second treatment group read the following:

“Some, however, worry that the incentives favor foreign firms over American [Japanese] firms as many hybrid, plug-in hybrid, or electric vehicles are produced by foreign automakers.”

The control or reference group does not read either of these vignettes. After reading the narrative and one of the vignettes, all respondents, including the reference group, move on to the conjoint experiment. The respondents also receive a glossary to ensure that they have information about the different types of cars so that they can respond to our questions (See Appendix). Because some respondents may not carefully read the provided information, we set up the vignette section of the survey so that the respondents cannot move to the forced-choice conjoint experiment until they spend a certain amount of time reviewing this page.

4. Findings

Fig. 1 summarizes the support among Americans and Japanese respondents in the control group for different EV subsidy packages. Because the results from conjoint experiments are sensitive to baseline categories, we follow Leeper et al. (2020) in calculating marginal means, which can be interpreted as the likelihood that a policy design with a particular attribute value is chosen, all else being equal. The marginal mean values are normalized at 0.5, which means that values greater than 0.5 reflect positive design preferences and values less than 0.5 reflect negative design preferences. That is, a marginal mean greater than 0.5 indicates that including a given policy dimension with a specific value increases support for a policy package relative to a policy package that does not include this dimension value.

Fig. 1 shows surprisingly similar results for the two countries regarding the policy dimensions of theoretical interest in the present study. In both countries, limiting the eligibility to the low-income groups reduces policy support while avoiding income-based eligibility increases support. Contrary to our expectations that Americans would support subsidies that target lower-income households, both Americans and Japanese exhibit a clear preference for a universalistic subsidy provision. Furthermore, excluding luxury cars from the subsidy package, a key issue in the U.S. policy debate, is not supported in either the U.S. or Japan.

This universalist preference extends to the carmaker and car type as well. While we expected Japanese respondents to support limiting subsidies to cars made by domestic automakers, in neither country do respondents support this eligibility restriction. Limiting subsidies only to EVs lowers the popularity of the policy in both countries, although our expectation was that it would face more resistance in Japan because Japanese auto companies have focused heavily on hybrids. The low popularity for limiting subsidies only to EVs may also reflect consumers’ anxiety about additional costs involved with EVs such as the availability of charging stations. Finally, in both countries, maintaining the subsidy at its lowest level (3000 USD/400,000 JPY) reduces the policy’s popularity, suggesting that the public prefers more extensive, universalistic EV subsidy policies.

These results suggest that the respondents in the control group do not incorporate distributional concerns in their EV subsidy policy preferences. However, it is important to test whether they would do so if primed by vignettes that focus on specific equity and distributional issues. Fig. 2 presents the results of the vignette experiment, comparing the control group with the two treatment groups, who read about distributive concerns associated with EV subsidies. Contrary to our expectations, respondents in both countries exhibit consistent preferences for universalistic subsidies over those that are progressively targeted or favoring domestic firms. Fig. 2 shows that in both countries, the point estimates of all attributes are close to each other between the three experimental groups and confidence intervals also overlap for all the attributes, which means that we do not find a (vignette) treatment effect, and the interpretations of Fig. 2 are substantively the same as the ones of Fig. 1.

This is surprising because, in the U.S., the EV subsidy debate centers on distributional equity at the individual level and the need to guard against subsidizing the wealthy. The expectation was that this type of priming would enhance the salience of individual-level issues in the EV policy package in the U.S. Similarly, we expected that the vignette

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8 We attempt to match the income threshold to one of the conjoint attributes (i.e., “Which household income group is eligible?”), although the scales are not perfectly aligned. We define the high-income if respondents earn more than $80,000 for the U.S. and 8,000,000 yen for Japan, both of which are above median income; the low-income otherwise.

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Table 2
Conjoint attributes and values.

<table>
<thead>
<tr>
<th>Conjoint Attribute (Eligibility Dimension)</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household income group</td>
<td>Below $35,000 (2,500,000 yen) (25% of households belong to this group)</td>
</tr>
<tr>
<td></td>
<td>Below $70,000 (4,500,000 yen) (25% of households belong to this group)</td>
</tr>
<tr>
<td></td>
<td>Below $125,000 (7,500,000 yen) (25% of households belong to this group)</td>
</tr>
<tr>
<td></td>
<td>All households</td>
</tr>
<tr>
<td>Retail price</td>
<td>Cars below $25,000 (2,000,000 yen)</td>
</tr>
<tr>
<td></td>
<td>Cars below $45,000 (4,000,000 yen)</td>
</tr>
<tr>
<td></td>
<td>Cars below $65,000 (6,000,000 yen)</td>
</tr>
<tr>
<td></td>
<td>Cars below $85,000 (8,000,000 yen)</td>
</tr>
<tr>
<td></td>
<td>All cars (no price limit)</td>
</tr>
<tr>
<td>Carmaker</td>
<td>Cars manufactured by American (Japanese) companies</td>
</tr>
<tr>
<td></td>
<td>Cars manufactured in the U.S. (Japan)</td>
</tr>
<tr>
<td></td>
<td>All cars</td>
</tr>
<tr>
<td>Vehicle Type</td>
<td>Electric cars</td>
</tr>
<tr>
<td></td>
<td>Electric and plug-in hybrid cars</td>
</tr>
<tr>
<td>Incentive per car</td>
<td>Up to $3,000 (400,000 yen)</td>
</tr>
<tr>
<td></td>
<td>Up to $7,000 (800,000 yen)</td>
</tr>
<tr>
<td></td>
<td>Up to $11,000 (1,200,000 yen)</td>
</tr>
<tr>
<td></td>
<td>Up to $15,000 (1,600,000 yen)</td>
</tr>
<tr>
<td>Incentive type</td>
<td>Income tax credit at the end of the tax year</td>
</tr>
<tr>
<td></td>
<td>Cashback rebate within a few months</td>
</tr>
<tr>
<td></td>
<td>Reduction in vehicle-related tax at the time of purchase</td>
</tr>
<tr>
<td>Trade-in requirement</td>
<td>Trade-in is not required to receive the incentives</td>
</tr>
<tr>
<td></td>
<td>Trade-in is required to receive the incentives</td>
</tr>
</tbody>
</table>
emphasizing the protection of domestic firms would enhance the salience of the industry-level dimensions in Japan. However, we find that respondents’ preferences did not change in response to the information treatment.

It is possible that these findings are due to the design of our conjoint analysis in combination with the vignette experiment. Respondents may have forgotten about the vignettes during their responses to the five paired comparisons. Because the vignette is shown once at the start of the five paired comparisons, it is possible that the information effect wanes for repeated paired comparisons. We thus conduct a robustness check using the responses from the first conjoint paired comparison only. This also serves as a robustness check for the assumption of independence. Figure A1 in the appendix shows that the results that focus only on the first paired comparison are very similar to those for all five paired comparisons together.

We also explore whether policy preferences vary depending on the characteristics of the respondents. Fig. 3 shows that, in both countries, high-income respondents oppose narrower means-testing and a lower limit on the car retail price. That is, high-income respondents exhibit a substantially stronger preference for universalistic subsidies. However, importantly, the figure also shows that the low-income respondents also prefer not to have strict income eligibility. In terms of the type of incentive, in the U.S. sample, we find that the low-income respondents favor receiving a cashback within a few months, while high-income respondents are indifferent to the type of incentives, although the difference just misses the 5% statistical significance level. In Japan, both the high- and low-income respondents favor vehicle tax reduction at the time of purchase and dislike income tax credits at the end of the tax year.

Figure A.2 examines whether the level of education affects respondent preferences for the EV subsidy design. The results are similar to those for the income levels; irrespective of their education level, respondents support more universalistic policies. Figure A.3 presents the effect of ethnicity in the U.S., with white and Asian respondents showing a stronger dislike for limiting the eligibility to low-income groups and to EVs and preferring more generous subsidies (up to $15,000) than other ethnic groups. We also explore whether EV ownership (Figure A.4) and environmental attitude (Figure A.5) shapes preferences for the EV subsidy design but do not find any meaningful difference by these factors.

Macro policies such as the existence of carbon pricing policies in the U.S. may also affect preferences for the EV subsidy design, but we do not find systematic differences between respondents in states with carbon pricing policies and those without (Figure A.6).

Fig. 4 investigates the effect of party affiliation. Climate policy scholars have noted the role of political ideology and partisanship in driving policy preferences (McCright et al., 2016; Drews and Van den Bergh, 2016; Cruz, 2017). However, among American respondents, we find no significant differences between Democrats and Republicans regarding income eligibility in the policy package. Both oppose narrow means-testing and favor universalistic policy packages. For the eligible carmaker dimension, while Democrats do not show any preferences, Republicans tend to favor restricting subsidies to domestic cars, although the difference is not statistically significant at the 5% level. In Japan, right-wing LDP supporters oppose narrow means-testing, and the popularity of the policy slightly increases when subsidies are limited to cars manufactured by Japanese companies.

5. Conclusion and policy implications

In the present study, we investigate whether distributional concerns influence public preferences for EV subsidies. When policy discourse frames EV subsidies as welfare for the rich, does public opinion, at least within some segments of the population, favor a progressive subsidy design that targets less privileged households and cheaper cars that they can be expected to buy? In addition, when policy discourse suggests that foreign automakers are reaping the benefits of EV subsidies, do respondents favor EV subsidies that are targeted at domestic firms?

Overall, we find that U.S. and Japanese respondents do not favor exclusionary subsidies favoring specific income groups or types of cars or companies. Thus, neither anti-rich populism nor anti-global nationalism seems to drive public preferences for EV policy packages. These results hold even when citizens are primed for specific distributional consequences of EV packages that are salient within their country. Political ideology does not seem to drive public preferences, either.

Our findings indicate that citizens are not so interested in the distributional aspects of the transition from ICEs to EVs. This is surprising given the recent debate on distributional conflict impeding climate progress (Akin and Mildenberger, 2020; Dolsak and Prakash, 2022), with justice groups emphasizing equity issues in the transition to a decarbonized economy via EVs or rooftop solar panels and noting that decarbonization gains tend to benefit wealthy households (Sunter et al., 2019; Henderson, 2020). Our findings suggest that the EV policy discourse centering on distributional politics is not reflected in public opinion. It appears that citizens do not pay attention to policy discourse,
and the salience of this issue remains low among the public when compared to political and economic experts.

Our findings thus suggest a significant elite and mass gap in approaching energy transition policies. Although explaining why such a gap exists is outside the scope of this paper, we offer tentative explanations that future research can ponder upon. One explanation is that the mass-level salience of distributional issues varies between energy transition policies or the framing of them. For example, when policies are discussed in terms of imposing costs, as in carbon tax policies that appear to hurt fossil fuel companies and regions, distributional issues might resonate more with the general public (Murray and Rivers, 2015; Farrell and Lyons, 2016; Tong et al., 2021). If so, the public might support revenue recycling from carbon taxes to alleviate the economic burden on communities directly hit by such tax policies. However, when a policy is concerned about the distribution of benefits, as in this study about EV subsidies or other policies such as solar rebates and incentives, distributional concerns might become less important.

Another related explanation for the mass-elite gap is that policy elites often respond to pressures from organized interest groups such as labor unions and automobile companies, who want to preserve their profits. The public at large, in contrast, is not directed by the economic fortunes of the domestic automobile industry and is more interested in fiscal incentives which can allow them to transition from internal combustion engines to electric vehicles. This by no means suggests that policymakers can disregard distributional justice when designing fiscal incentives for energy transition. What our findings suggest is that policymakers can emphasize universal benefits associated with such incentives, which can help garner more broad-based support for the policies.

A key implication of our finding is that the role of distributional conflict in driving the climate political economy requires more study. We believe this is an important issue that goes beyond EV subsidies and a key agenda for future research as the climate crisis worsens and governments seek to accelerate the transition to a decarbonized economy (Wood et al., 2020). Future research can also replicate this study in countries that have advanced EV industries such as China, South Korea, and the European Union, as well as in countries that have established...
auto industries but lag behind in EV production.

CRediT authorship contribution statement

Sjeong Lim: Project administration, Investigation, Writing-all stages. Nives Dolsak: Conceptualization, Methodology, Writing-all stages. Aseem Prakash: Conceptualization, Methodology, Writing-all stages. Seiki Tanaka: Data curation, Formal analysis, Writing-all stages.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgment

Sjeong Lim was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-2020S1A5A8040915)

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.enpol.2022.112883.

References


Fig. 4. All groups aggregated by party affiliation (U.S. on top and JP on bottom).
