This survey is focused on the opinions of consumers CURRENTLY owning at least one of the following vehicles:

- ***Plug-In Hybrid Electric Vehicle*** **(PHEV)** – i.e. a hybrid vehicle in which the battery can be charged by plugging it into an outlet/charger in addition to being charged when operating on the gas engine
- ***Battery Electric Vehicle*** **(BEV)** – i.e. a vehicle that gets all power from a battery only

1. Using the definitions provided above, do you currently have a plug-in hybrid electric vehicle (PHEV) or battery electric vehicle (BEV) in your household?

   DROP DOWN BOX: Choose one:

   a. No, I do not have either *[GO TO THANK YOU]*
   b. Yes, I have a PHEV
   c. Yes, I have a BEV
   d. Yes, I have both
      i. [ADD NOTE IF "YES" (b, c or d): "Great! Your car is able to make a lot of electricity, so we are going to ask you your opinions about new products that would let you use that electric power in case of a blackout at home, or for recreational activities."]

Section 1: Demographics – **We will first ask a few demographic questions. You will complete this very quickly.**

1. Please list the MAKE (e.g. Tesla), MODEL, (e.g. Model X), and YEAR (e.g. 2016) of up to two PHEVs and/or BEVs that you CURRENTLY own. (If you own more than two, please record the two newest vehicles.)
   DROP DOWN BOX: Choose one:
   a. VEHICLE 1: Make _____ Model _____ Year _____
   DROP DOWN BOX: Choose one:
   b. VEHICLE 2: Make _____ Model _____ Year _____
2. Thinking of your next PHEV or BEV vehicle, would you more likely lease or own that future vehicle?
   DROP DOWN BOX: Choose one:
   a. Lease
   b. Own (pay cash or finance)
3. Which of the following best describes your current housing situation? DROP DOWN BOX: Choose one:
   a. A single unit house
   b. A multiple unit condo/townhouse
   c. An apartment
   d. Other (Please specify) [TEXT BOX]
5. At home, do you have photovoltaic (rooftop solar) panels? DROP DOWN BOX: Choose one:
   a. Yes [ADD NOTE IF "YES": "Potential features that we'll be asking you about include the ability to use your home's solar system even when there is a blackout, and to store extra energy in your vehicle battery."]
   b. No
7. Do you own a gasoline generator? DROP DOWN BOX: Choose one:
   a. Yes
   b. No

Section 2: Technology Description - We would like to gauge your interest in factory options that would allow you to send electrical power out of your vehicle's battery. **As a factory option, rather than a third party add-on, using it as intended would not adversely impact your warranty.**

Potential capability:
In case of power outage, your vehicle sends power out to your home

Direction of power flow

Potential capability:
When away from a home outlet, your vehicle sends power out to your camping & recreation equipment

Direction of power flow

Percent complete 12%

Section 3: General Interest

1. **At the highest level, how interested would you be in having the ability to take electrical power out of your PHEV/BEV?**
   DROP DOWN BOX: Choose one:
   a. I am interested and would be willing to pay a reasonable price for this technology. **[GO TO "INTEREST"]**
   b. I am slightly interested. I would take the technology if it were offered for free or nearly free. **[GO TO "INTEREST"]**
   c. I am not interested at all. I would not want this type of technology on my vehicle or in my house. **[GO TO "NO INTEREST"]**
2. **NO INTEREST** - You have responded that you would have no interest in this technology. Could we get a little more background on why you feel that way? (Please select all that apply) CHECKBOXES: Choose all that apply:

   a. I don't see the use because blackouts or power outages are not a problem where I live.
   b. I don't see the use because I don't tailgate or go camping.
   c. I don't want to risk running down the battery on my vehicle. I prefer to keep the car battery charged.
   d. I would be concerned about the impact on battery life or vehicle warranty.
   e. Other – please explain **[TEXT BOX]**

   [GO TO "THANK YOU"]

3. **INTEREST** - You have responded that you would have an interest in this technology. What uses/features do you ***most value***? Please explain in as few words as possible **[TEXT BOX]**

   BASED ON ANSWERS TO **DEMOGRAPHIC *Q1*:**

   - *If "PHEV" - [GO TO VEHICLE CONNECTOR SECTION]*
   - *If "BEV" - [GO TO HOUSE COMPONENT SECTION]*
   - *If "BOTH" - [GO TO VEHICLE CONNECTOR SECTION]*

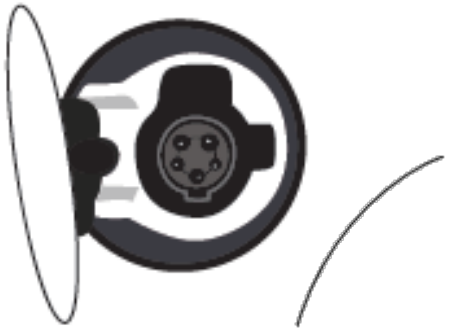
Section 4: **Vehicle Connector Section** **[COMING FROM "INTERESTED"]**

Getting power out of your vehicle battery may require two devices. You must have:

(1) A vehicle with power export capability

(2) And in some higher output cases, a two-way Electric Vehicle Supply Equipment (EVSE) charger

1



2

Percent complete 20%

Section 4: **Vehicle Connector Section**

Getting power out of your vehicle battery may require two devices. You must have:

(1) A vehicle with power export capability

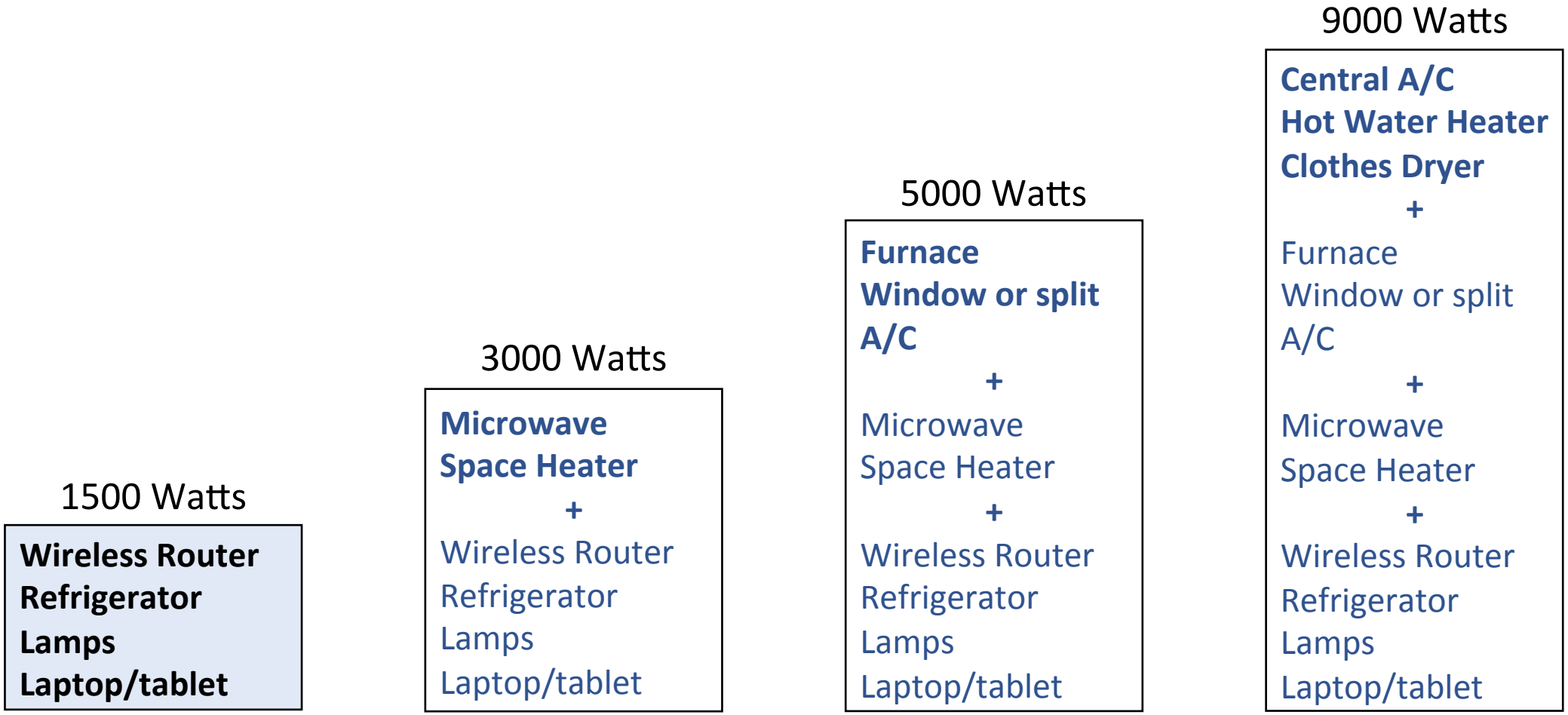
(2) And in some higher output cases, a two-way Electric Vehicle Supply Equipment (EVSE) charger

In the following few questions, we ask **only about your willingness to pay for the vehicle with an optional in-cabin outlet and/or the upgraded charge receptacle –** we will ask about buying the two-way EVSE charger later

Section 4: **Vehicle Connector Section**

As the level of power sent out of your battery is increased, you can run more powerful home devices.

We will ask you about a vehicle with each of the following power out options: 1500W, 3000W, 5000W, and 9000W … starting with the 1500W option.



Section 4: Vehicle Connector Section

Imagine you are shopping for a new Plug-In Electric Vehicle. You have narrowed your decision down to two identical vehicles – except one of the vehicles has several 1500W outlets in the cabin.

Power Out Level: **1500 Watts**	
Appliances you could power:	• Wireless Router • Refrigerator • Lamps • Laptop/tablet
Connect to your devices via the optional in-cabin outlets	

How much would you pay for the vehicle with the ability to send up to 1500W power out?

Please fill in all the blanks – even if the value is $0.

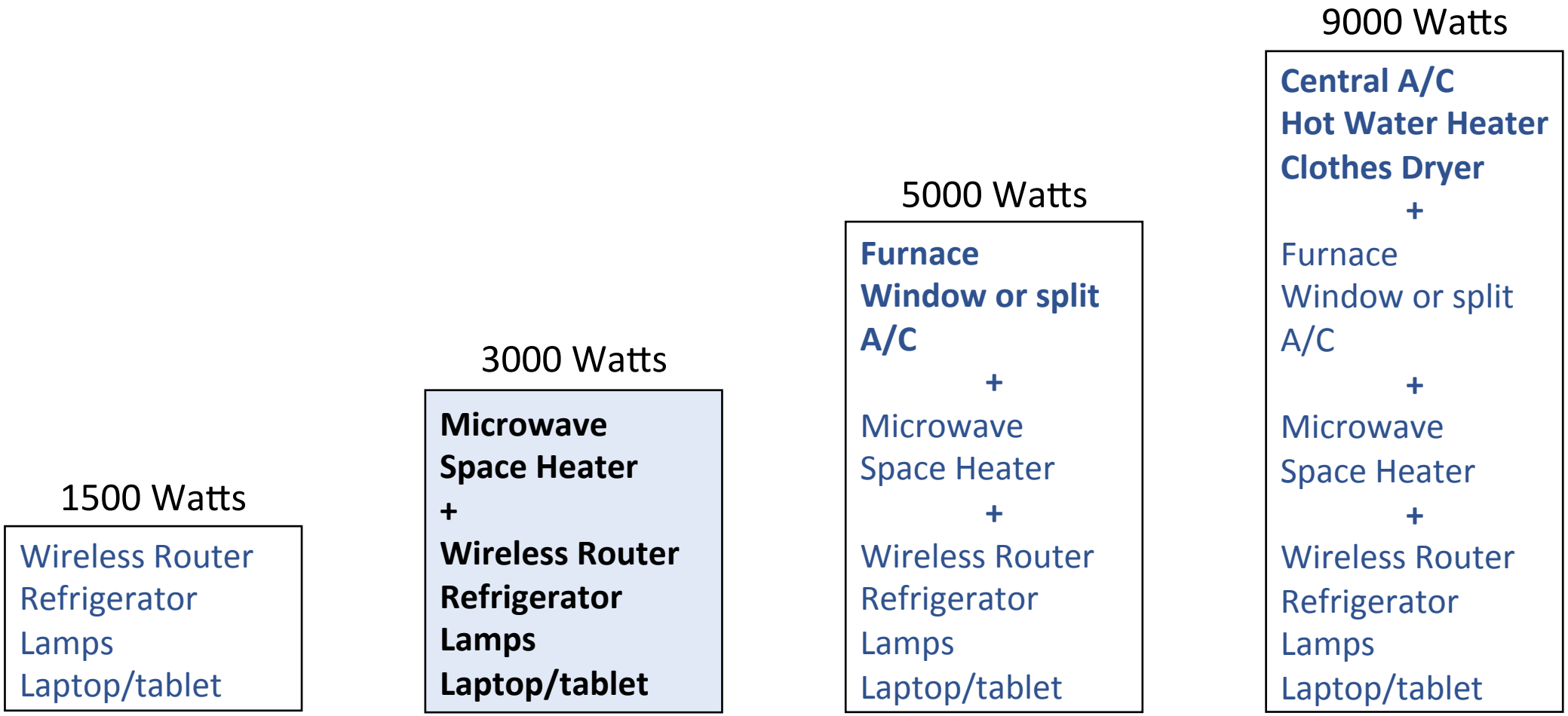
I would be very likely to buy the vehicle with this option if it cost only $____ more than one without it.

I would be very unlikely to buy it if it cost more than $____.

Section 4: **Vehicle Connector Section**

As the level of power sent out of your battery is increased, you can run more powerful home devices.

Next, 3000W.



Section 4: Vehicle Connector Section

What if a third vehicle could send even more power out through the in-cabin outlets: **3000W**?

Power Out Level: **3000 Watts**	
Appliances you could power:	PLUS: • Microwave • Space Heater
Connect to your devices via the optional in-cabin outlets	

How much would you pay for the vehicle with the ability to send up to 3000W power out?

Please fill in all the blanks – even if the value is $0.

I would be very likely to buy the vehicle with this option if it cost only $____ more than one without it.

I would be very unlikely to buy it if the option cost more than $____.

Your 1500W responses were:

$____

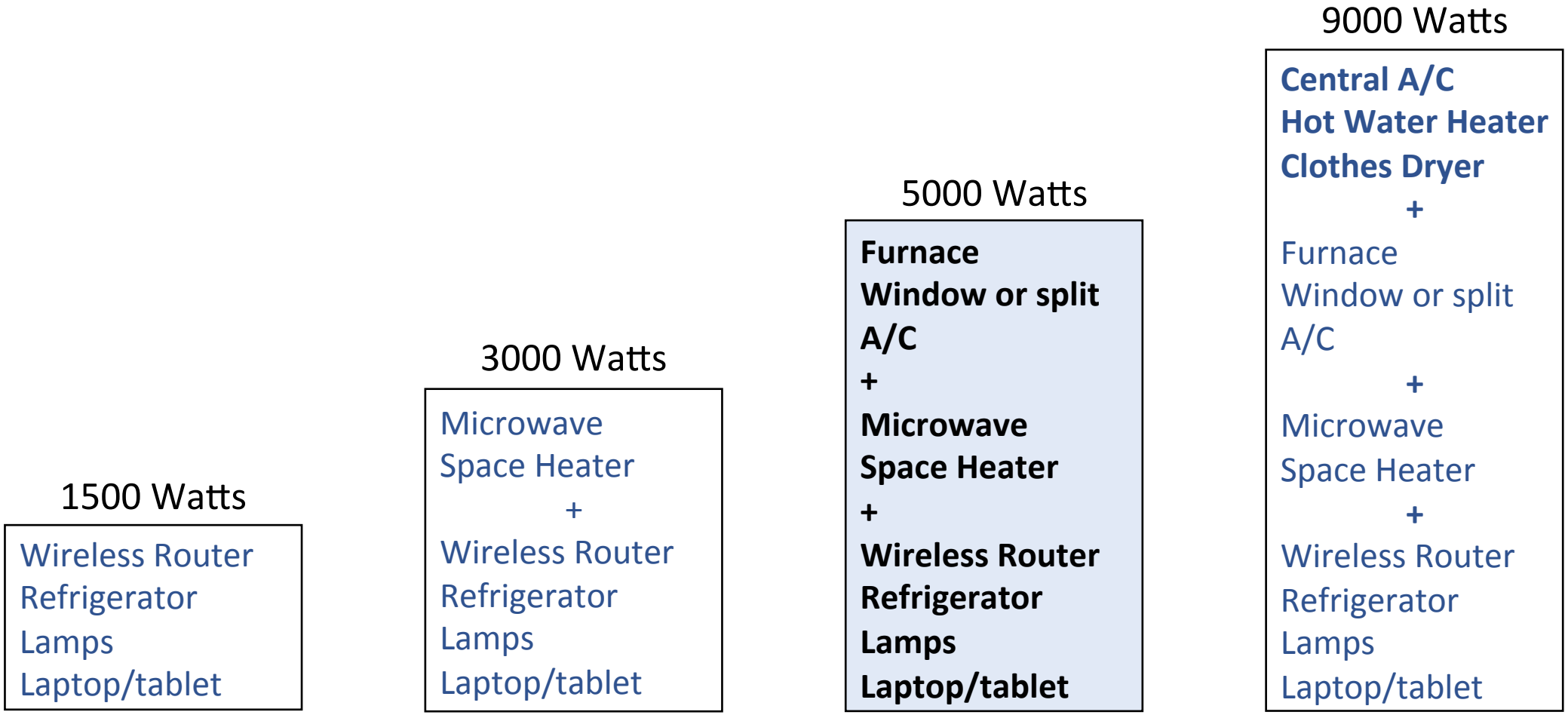
$____

Percent complete 40%

Section 4: **Vehicle Connector Section**

As the level of power sent out of your battery is increased, you can run more powerful home devices.

And now, 5000W.



Section 4: Vehicle Connector Section

Now for even more power out. Rather than in-cabin outlets, this vehicle has an optional two-way device on the vehicle charge receptacle. This could send up to **5000W** of power out of your vehicle.

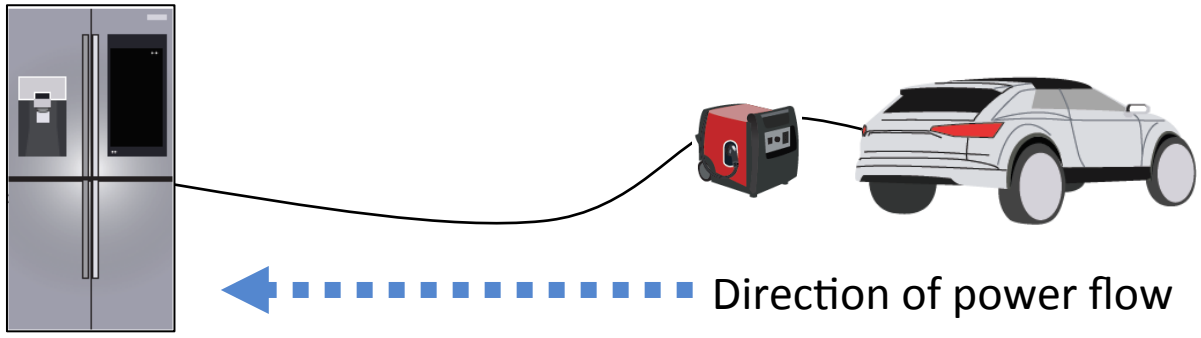
Power Out Level: **5000 Watts**	
Appliances you could power:	PLUS: • Furnace • Window or Split A/C
Connect to your devices via a charge receptacle upgrade*	

* Requires an upgraded EVSE charger, or a power-control device, purchased later

How much would you pay for the vehicle with the ability to send up to 5000W power out?

Please fill in all the blanks – even if the value is $0.

	Your 3000W responses were:
I would be very likely to buy the vehicle with this option if it cost only $____ more than one without it.	$____
I would be very unlikely to buy it if the option cost more than $____.	$____

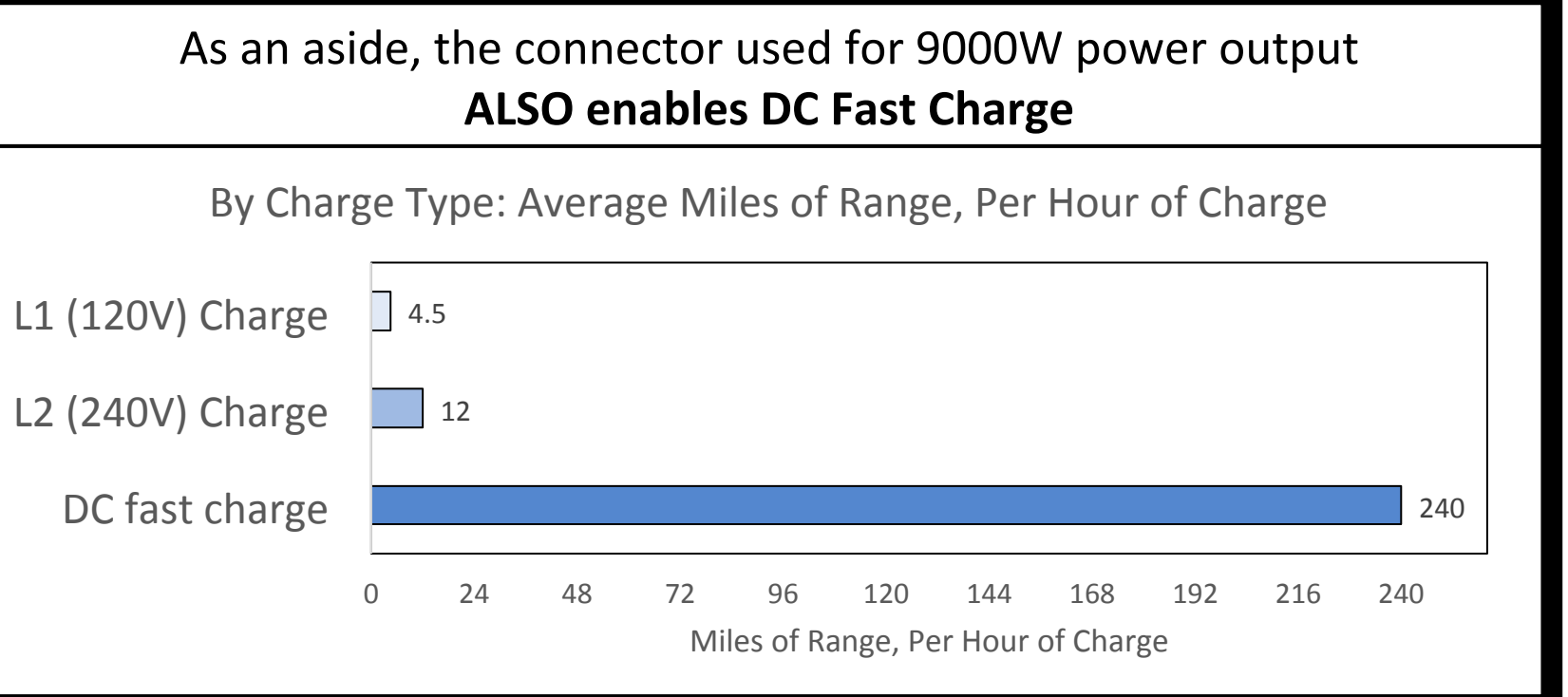


Section 4: **Vehicle Connector Section**

As the level of power sent out of your battery is increased, you can run more powerful home devices.

And lastly, 9000W.

As an aside, the connector used for 9000W power output
ALSO enables DC Fast Charge



Source: evsolutions.com - Charge times can vary based on vehicle and/or environmental conditions

9000W

Central A/C
Hot Water Heater
Clothes Dryer
+
Furnace
Window or split A/C
+
Microwave
Space Heater
+
Wireless Router
Refrigerator
Lamps
Laptop/tablet

Section 4: Vehicle Connector Section

Now for even more power out. Rather than in-cabin outlets, this vehicle has an optional two-way device on the vehicle charge receptacle. This could send up to **9000W** of power out of your vehicle.

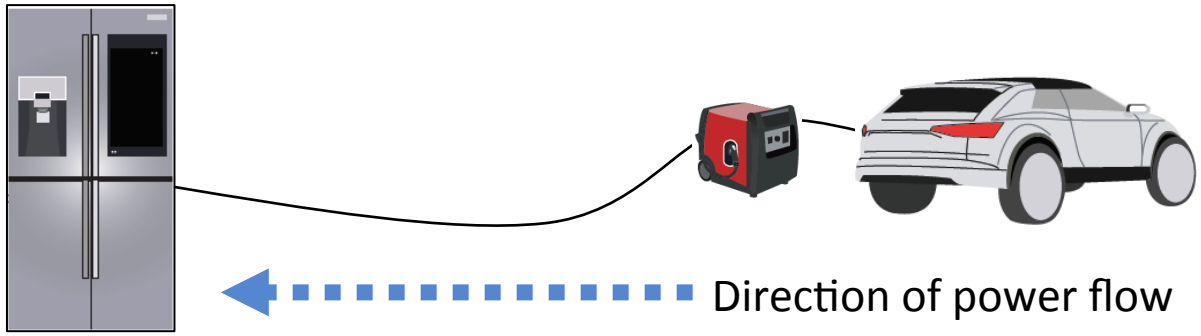
Power Out Level: **9000 Watts**	
Appliances you could power:	PLUS: • Central A/C • Hot water heater
DC Fast Charge?	YES
Connect to your devices via a charge receptacle upgrade*	

* Requires an upgraded EVSE charger, or a power-control device, purchased later

How much would you pay for the vehicle with the ability to send up to 9000W power out?

Please fill in all the blanks – even if the value is $0.

	Your 5000W responses were:
I would be very likely to buy the vehicle with this option if it cost only $____ more than one without it.	$____
I would be very unlikely to buy it if the option cost more than $____.	$____



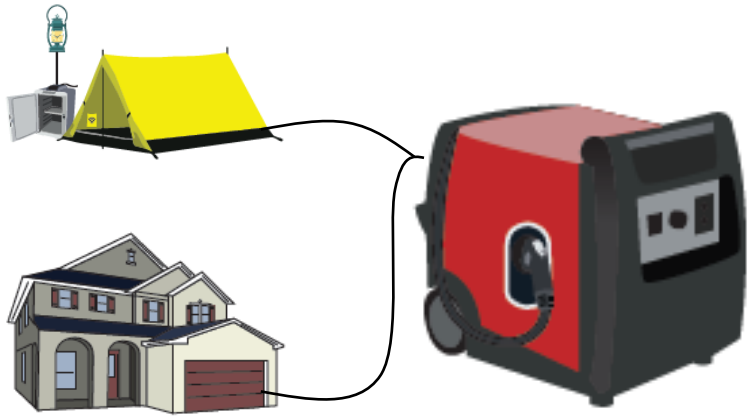
[NOTE – THIS IS WHERE THE BEV OWNERS WOULD START, THE PHEV OWNERS WOULD BE COMING FROM THE VEHICLE COMPONENTS SECTION]

Section 5: Home Components Section - Introduction

Imagine you own a vehicle that has the ability to send large amounts of power out through its charging port. To send power into your home and/or recreation items, you also must have a power-control device.

Device 1: Portable Power Box

(Applicable for both 5000W and 9000W)



Device 2: Fixed Mount Power Box – Connect Through Outlets
(Applicable for 5000W only)

Device 3: Fixed Mount Power Box – Hardwire Through Circuit Box
(Applicable for both 5000W and 9000W)

The following pages will explore your preferences, and willingness to pay, for power-control devices with various capabilities. We will first ask about 5000W devices and then ask about 9000W devices.

Section 4: **Vehicle Connector Section**

As the level of power sent out of your battery is increased, you can run more powerful home devices.

Imagine your vehicle has the capability to export power. To transfer that power out requires a power-control device. Let's start with devices that can transfer power up to 5000 Watts…

5000 Watts

Furnace
Window or split A/C
Microwave
Space Heater
Wireless Router
Refrigerator
Lamps
Laptop/tablet

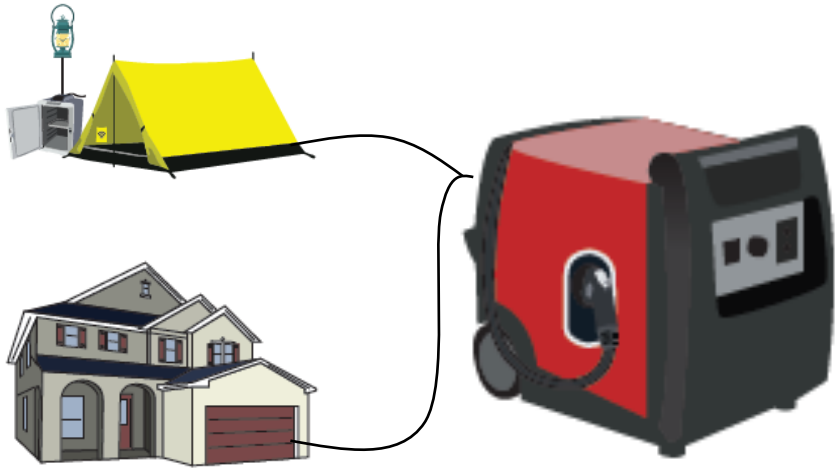
9000 Watts

Central A/C
Hot Water Heater
Clothes Dryer
+
Furnace
Window or split A/C
Microwave
Space Heater
Wireless Router
Refrigerator
Lamps
Laptop/tablet

Section 5: Home Components Section

Consider a portable device … How much would you pay for a portable power-control device, with a bank of outlets, which can transfer up to 5000W in home or out of home?

Power Out Level: **5000 Watts**	
How you connect	Plug extension cord(s) directly into outlets on the portable device
Acts as the vehicle charging device?	No
Allows PV/ Solar Panels to be powered back on in the event of a blackout?	No



Please fill in all the blanks – even if the value is $0.

I would be very likely to buy the device if it only cost $____

I would be very unlikely to buy it if it cost more than $____

Section 5: Home Components Section

In contrast to a portable device … How much would you pay for a device that is wall-mounted, with a bank of standard outlets, which can transfer up to 5000W?

Power Out Level: **5000 Watts**	
How you connect	Plug extension cord(s) directly into outlets on the EVSE charger
Acts as the vehicle charging device?	YES
Allows PV/ Solar Panels to be powered back on in the event of a blackout?	No

Please fill in all the blanks – even if the value is $0.

I would be very likely to buy the device if it only cost $____

I would be very unlikely to buy it if it cost more than $____

Your portable responses were:

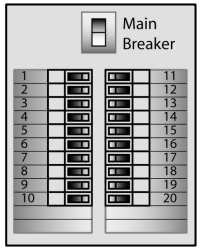
$____

$____

Section 5: Home Components Section

Now for a device hardwired into your electrical panel … How much would you pay for a wall-mounted device, that you hardwire to your electrical panel, which can transfer up to 5000W?

Power Out Level **5000 Watts**	
How you connect	EVSE connects to your electrical panel to your home
Acts as the vehicle charging device?	YES
Allows PV/ Solar Panels to be powered back on in the event of a blackout?	YES



Please fill in all the blanks – even if the value is $0.

I would be very likely to buy the device if it only cost $____

I would be very unlikely to buy it if it cost more than $____

Your outlet bank responses were:

$____

$____

Percent complete 76%

Section 5: Home Components Section

Lastly, a twist … How much would you pay for the same wall mounted - hardwired device; but, enables occasionally selling electricity back to the utility for which you would be paid $50/month ($600/year)?

Power Out Level **5000 Watts**	
How you connect	EVSE connects to your electrical panel to your home
Acts as the vehicle charging device?	YES
Allows PV/ Solar Panels to be powered back on in the event of a blackout?	YES

Please fill in all the blanks – even if the value is $0.

I would be very likely to buy the device if it only cost $____

I would be very unlikely to buy it if it cost more than $____

Your hardwired responses were:

$____

$____

Percent complete 80%

Section 5: **Home Components Section**

As the level of power sent out of your battery is increased, you can run more powerful home devices.

Imagine your vehicle has the capability to export power. To transfer that power out requires a power-control device. Let's conclude with devices that can transfer power up to 9000 Watts…

5000 Watts

Furnace
Window or split A/C
Microwave
Space Heater
Wireless Router
Refrigerator
Lamps
Laptop/tablet

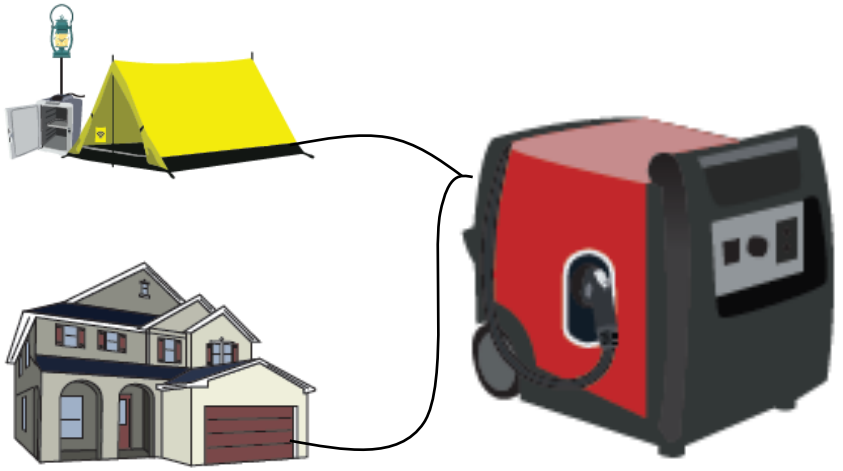
9000 Watts

Central A/C
Hot Water Heater
Clothes Dryer
+
Furnace
Window or split A/C
Microwave
Space Heater
Wireless Router
Refrigerator
Lamps
Laptop/tablet

Section 5: Home Components Section

Consider a more powerful portable device … How much would you pay for a portable power-control device, with a bank of outlets, which can transfer up to 9000W?

Power Out Level: **9000 Watts**	
How you connect	Plug extension cord(s) directly into outlets on the portable device
Acts as the vehicle charging device?	No
Allows PV/ Solar Panels to be powered back on in the event of a blackout?	No



Please fill in all the blanks – even if the value is $0.

I would be very likely to buy the device if it only cost $____

I would be very unlikely to buy it if it cost more than $____

5000W portable responses were:

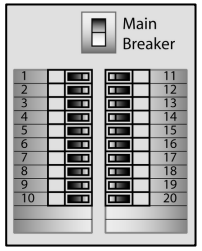
$____

$____

Section 5: Home Components Section

Now the more powerful hardwired device … How much would you pay for a wall-mounted device, that you hardwire to your electrical panel, which can transfer up to 9000W?

Power Out Level: **9000 Watts**	
How you connect	Charger connects to your electrical panel to your home
Acts as the vehicle charging device?	YES
Allows PV/ Solar Panels to be powered back on in the event of a blackout?	YES



Please fill in all the blanks – even if the value is $0.

I would be very likely to buy the device if it only cost $____

I would be very unlikely to buy it if it cost more than $____

5000W wall mounted responses were:

$____

$____

Section 5: Home Components Section

Finally, the twist … How much would you pay for the same wall mounted - hardwired device; but, enables occasionally selling electricity back to the utility for which you would be paid $100/month ($1,200/year)?

Power Out Level **9000 Watts**	
How you connect	Charger connects to your electrical panel to your home
Acts as the vehicle charging device?	YES
Allows PV/ Solar Panels to be powered back on in the event of a blackout?	YES

Please fill in all the blanks – even if the value is $0.

I would be very likely to buy the device if it only cost $____

I would be very unlikely to buy it if it cost more than $____

5000W hardwired / buy back responses:

$____

$____

Percent complete 100%

THANK YOU

Thank you very much for taking the time to give us your views and opinions on products that would allow you to export power from your PHEV or BEV. We appreciate your time and consideration. If there are any other comments you would like to provide please add them below.

[TEXT BOX]

END SURVEY