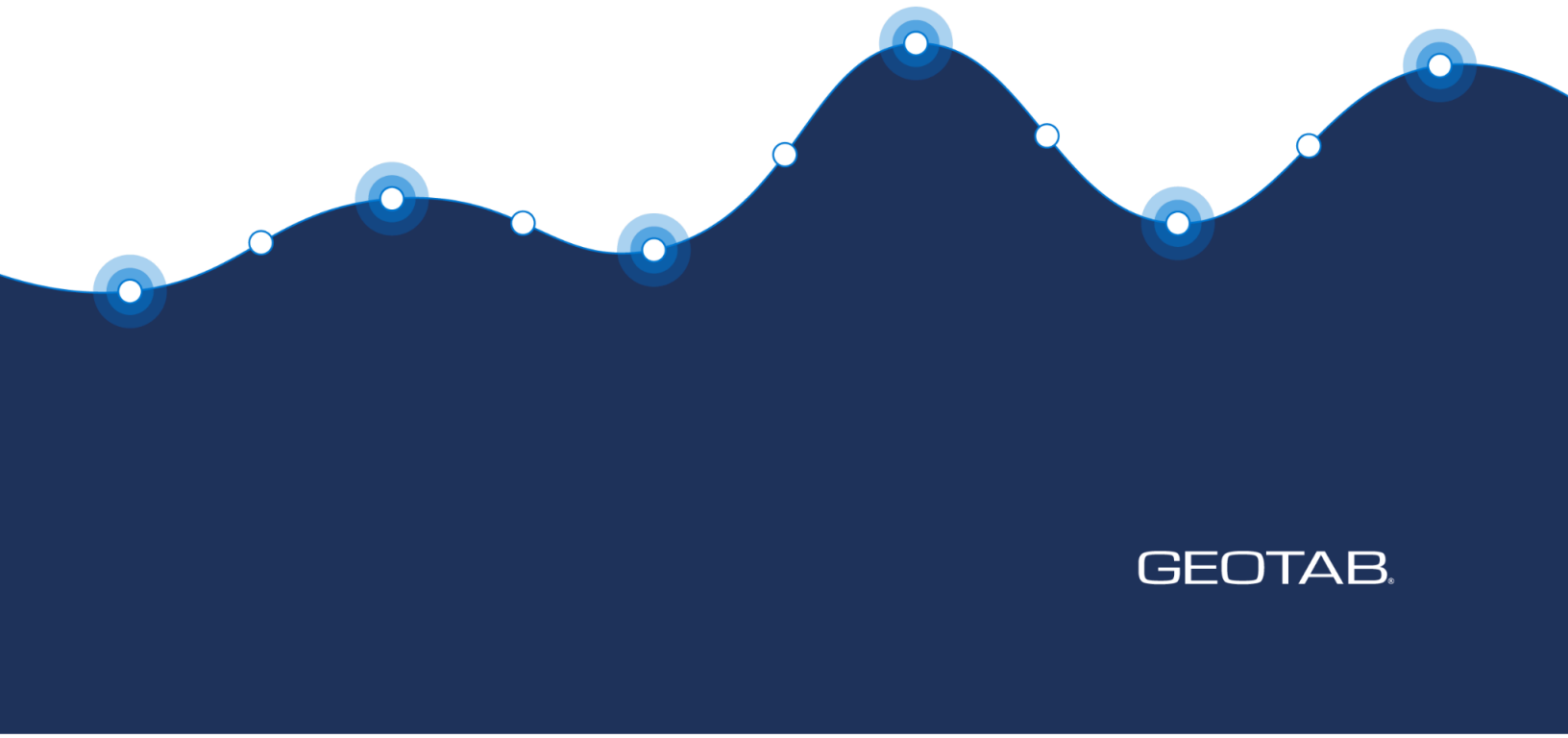
Electric Vehicle Suitability Assessment

User Guide

November 2024



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Introduction

The **Electric Vehicle Suitability Assessment (EVSA)** is a Geotab tool intended to help fleet managers identify a variety of suitable Electric Vehicles (EV) to replace their current non-electric fleet vehicles. To perform the analysis, the EVSA utilizes your fleet telematics data to get an accurate view of the fleet's drive cycle.

✱ **NOTE:** Vehicles should have at least one month of data collected in MyGeotab for a suitable recommendation. Fleets with seasonal drive cycles should run the EV Suitability Assessment using data collected over long periods of time.

The EVSA analyzes the driving data for fleet vehicles and recommends an EV replacement that meets the criteria in the table below.

Condition	Description
Range Capability	The EV replacement fulfills the daily driving range requirement of the current fleet vehicle without the need to charge en-route during the day. If the EV cannot meet the range requirement, the EV is not recommended as a replacement.
Charging Viability	The EV replacement dwells long enough in designated charging zones that it can be sufficiently charged for the next set of trips without having to charge en-route during the day.
Lifetime Cost	The lifetime cost for the EV replacement must be less than or equal to the cost of the equivalent non-Electric Vehicle. Lifetime cost considers EV incentives and the funds that an organization has allocated to reduce emissions, if applicable.

✱ **NOTE:** The range analysis considers degraded real-world range of the EVs — defined as the expected EV range in cold weather conditions when battery efficiency is diminished and the heating system remains on.

Supported vehicle types

The EV Suitability Assessment tool supports the following vehicle types:

- Passenger Cars
- Crossover/SUVs
- Minivans
- Pickup Trucks
- Light Duty Vans

Supported countries

The EV Suitability Assessment is officially available in the following countries:

- United States
- Canada
- United Kingdom
- Germany
- The Netherlands
- Spain

- France
- Italy
- Ireland
- Poland
- Singapore
- Mexico
- Brazil
- Colombia
- Chile
- Australia
- New Zealand

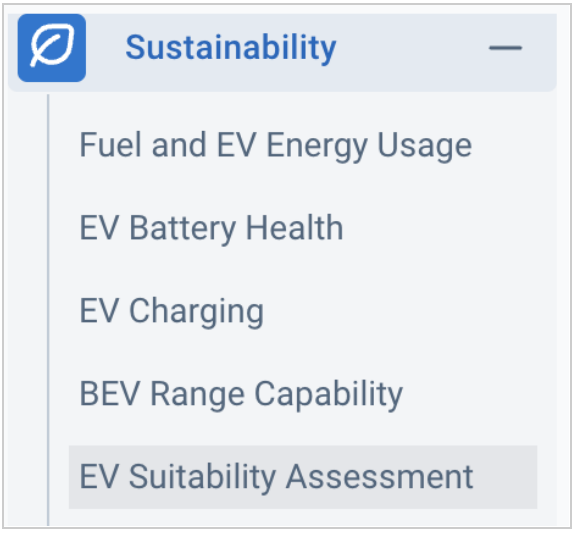
Support in the countries listed above includes the user interface language, the units of measurement, currency, local vehicle model availability, and default costs.

✱ **NOTE:** If the user resides in a country that is not supported, the EVSA will not restrict the EV model selection to the user's local market. The user must also review and update the default costs to match their locale.

Starting a new assessment

To start a new assessment, follow the steps below:

1. From the MyGeotab main menu, navigate to **Sustainability** > **EV Suitability Assessment**.



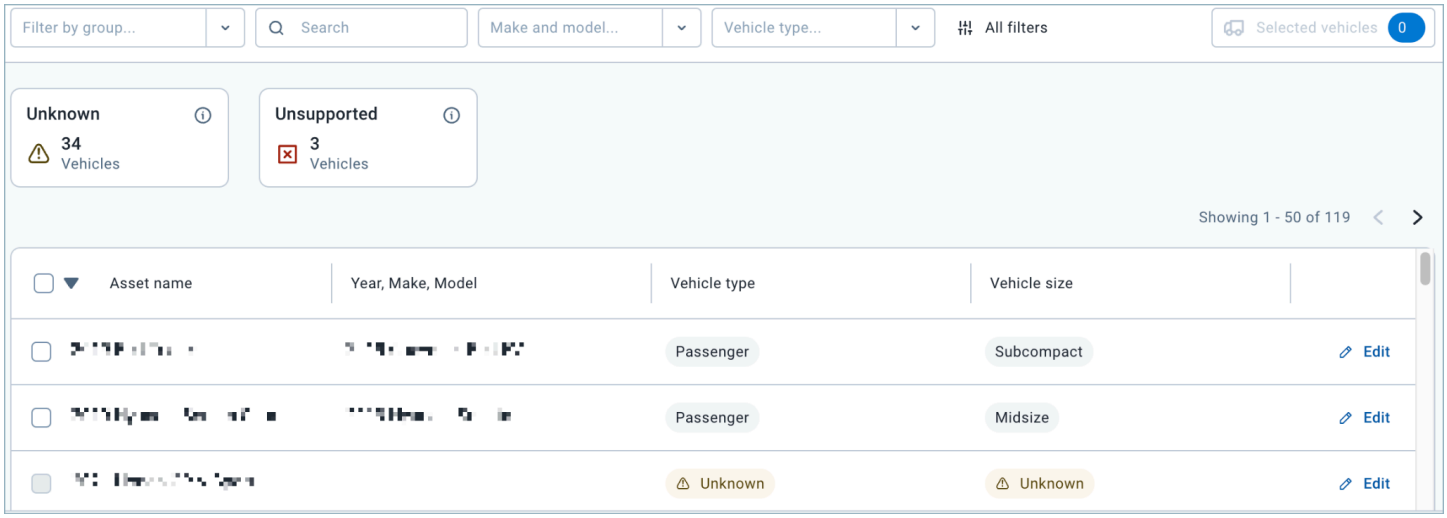
2. From the **Electric Vehicle Suitability Assessment** page, click **+ New assessment**.

3. Select the desired country from the list to open the **Electric Vehicle Suitability Assessment**.

The Electric Vehicle Suitability Assessment is divided into four sections: **Vehicles to Assess**, **EV Models**, **Charging Locations**, and **Preferences**.

Vehicles to Assess

Under **Vehicles to Assess**, select the vehicles you want to include in your assessment. By default, all the vehicles are listed, and none are selected. Use filters to refine the vehicle list and select the set of vehicles you are interested in assessing.



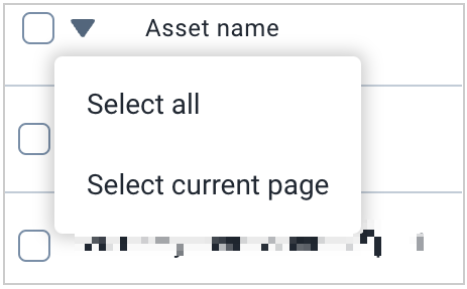
Vehicle filtering

You may use the following tools and filters to refine the list of vehicles you wish to select for the assessment:

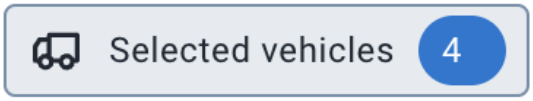
- **Filter by group…** — Refine the vehicle list based on the groups to which they belong on MyGeotab.
- **Search** — Filter the vehicles list by asset name, make and model, or vehicle type. Filtering starts as soon as you type into the search box.
- **Make and model…** — Refine vehicle lists based on their make and model. You can select multiple values from the list.
- **Vehicle type…** — Refine the fleet vehicles list based on their detected vehicle type. You can select multiple values from the filter list.
- All filters — Open **All filters** to filter the list by **Vehicle age**. The **Vehicle Age** filter allows you to select vehicles that are older than a specific number of years based on their decoded VINs.

Vehicle selection

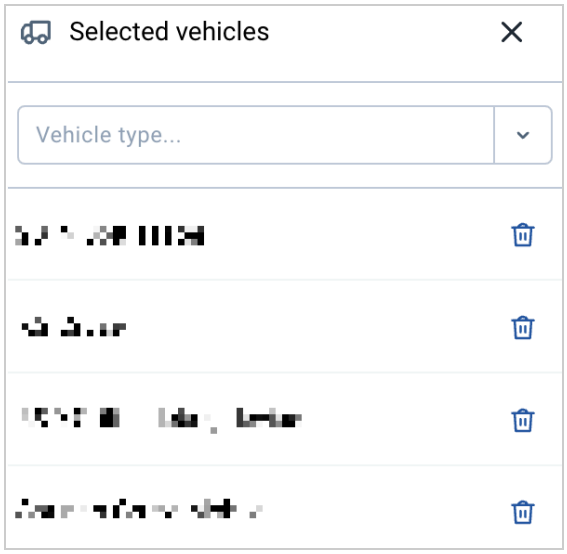
1. Once you have filtered your vehicle list to find your vehicles of interest, select the checkbox in the page header to select all vehicles listed in the current page. Alternatively, select the checkbox for individual vehicles or click the black arrow next to the checkbox to select all filtered vehicles across all pages rather than the ones listed on the current page only.



2 If needed, open the **Selected vehicles** dropdown to review the list of selected vehicles.



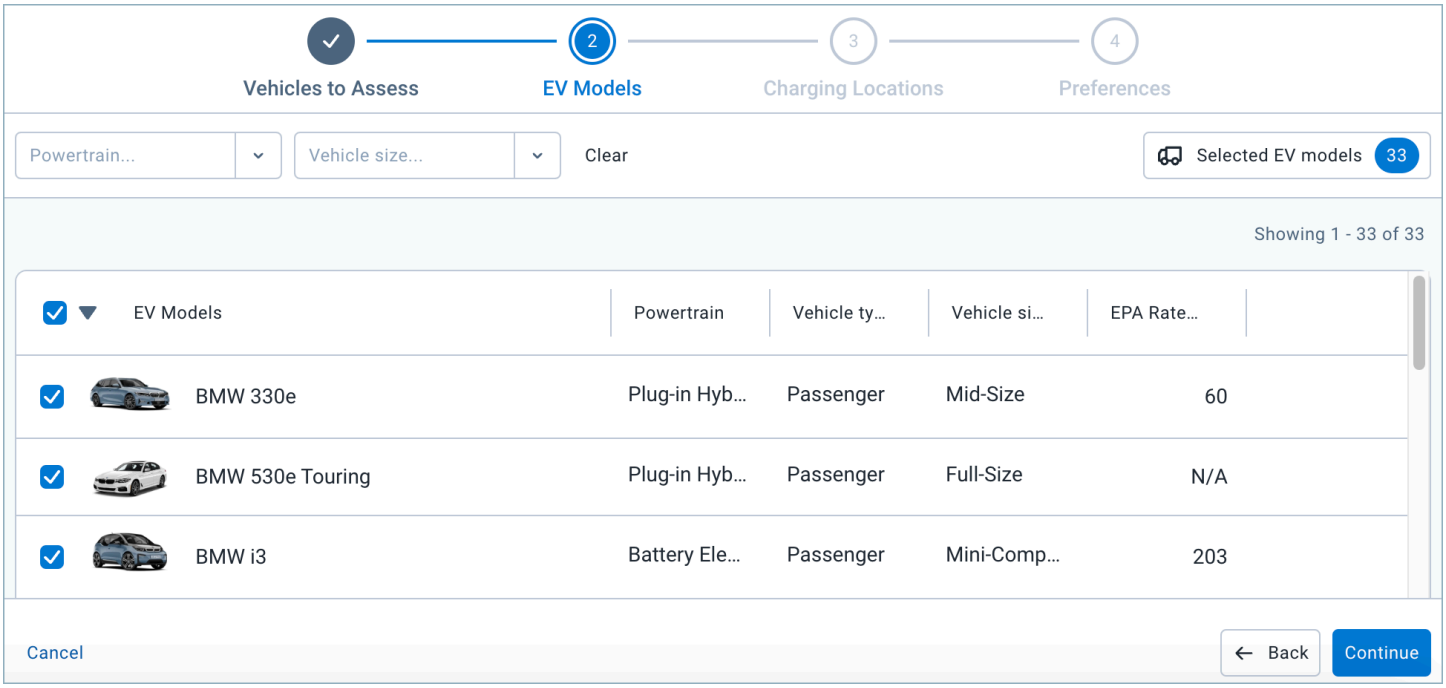
3 From the Selected vehicles side panel, you can exclude vehicles from the assessment by clicking the trashcan icon next to their name. After reviewing, click **Done**.



EV Models

In the EV models step, review the electric vehicles that will be considered as replacement candidates for your selected vehicles. All EV models are selected by default. You can refine the list of EVs using the **Powertrain**, **Vehicle Type**, or **Vehicle Size** filters.

After selecting the EV models, click **Continue**.



Charging Locations

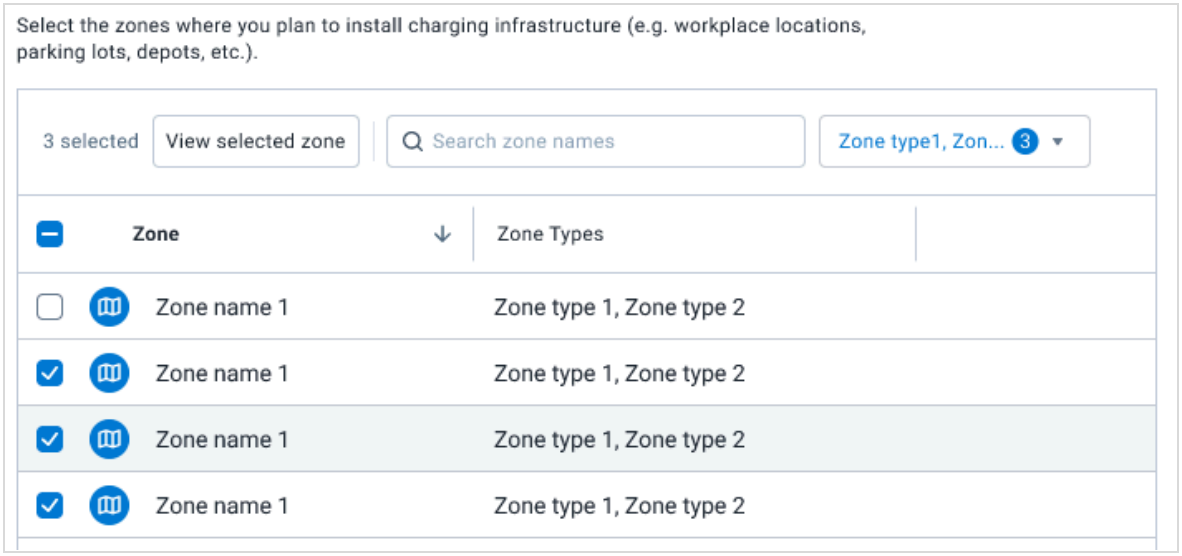
Select the locations where you plan to install chargers. The assessment will perform a charging viability analysis by checking whether the fleet vehicles stop long enough in the selected locations to fulfill their charging needs.

Selecting locations

1. Under **Charging Locations**, select the option that matches your planned deployment:
   - **Workplace Locations** — Charging viability analysis will only consider charging opportunities at workplace locations. You will need to select the zones that define your chosen workplace locations in the next step.
   - **Workplace Locations & Drivers' Homes** — Charging viability analysis will consider charging opportunities at workplace locations as well as drivers' homes. You will need to select the zones that define your chosen workplace locations in the next step. You **do not** have to create or select zones for drivers' homes as these locations will be auto detected. The EVSA assumes that a driver's home is the location where a vehicle stops for the longest time outside any of the selected workplace location zones.
   - **Skip Charging Viability Analysis** — Select this option if you do not wish to select zones and perform charging viability analysis. The analysis will assume that the EV starts each day with a fully charged battery.
2. If you selected **Workplace Locations** or **Workplace Locations and Drivers' Homes**, you can select the Geotab zones that outline the workplace locations where you plan to install a charging infrastructure.

   ✱ **NOTE**: If you do not have existing zones created for the desired locations, please create them in the **Zones** page before proceeding. Refer to the Product Guide for more information.

3 If needed, search for a zone by name or use the zone type filter to narrow down the list. To select a zones, select the checkmark next to its name.

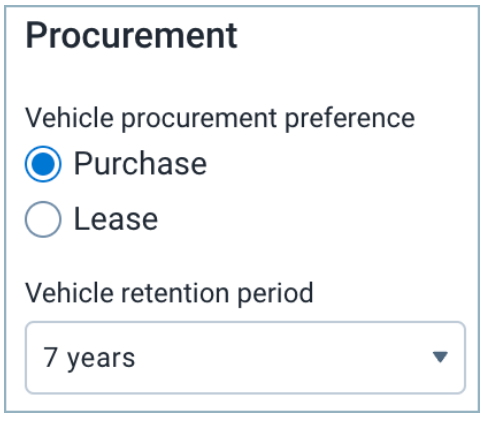


Preferences

In this step, you can modify the report preferences related to the procurement model, default costs, and analysis period.

Procurement

Under **Procurement**, select whether you intend to purchase or lease the EVs. Then, from the dropdown menu, select the expected **vehicle retention period**.

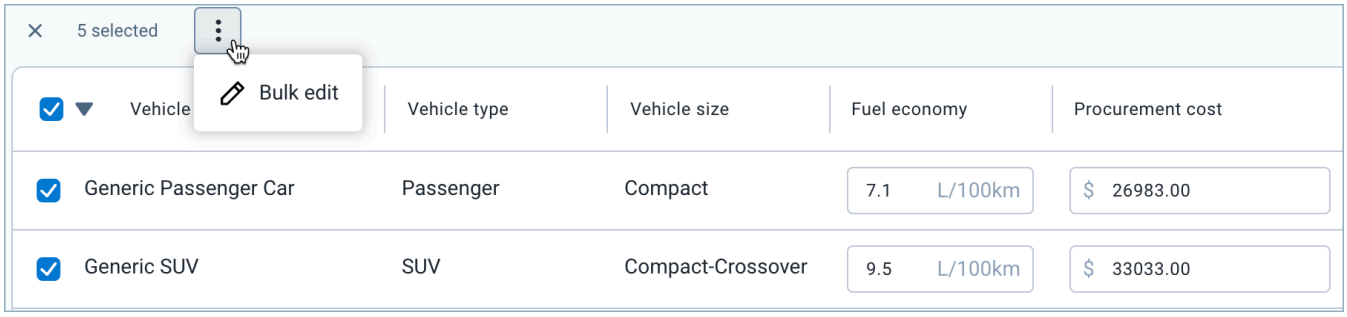


Non-EV Costs

Under Non-EV Costs, review the **Average fuel price** and update it if necessary.

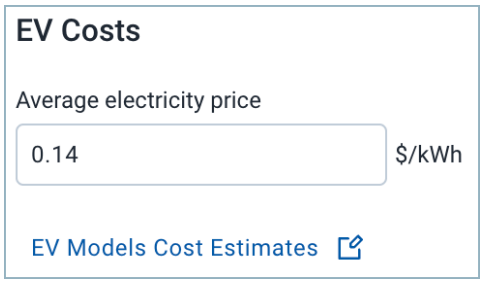
Click on **Non-EV Cost Estimates** review and modify the estimated costs related to non-electric vehicles used in the assessment. On this page, you can modify cost and fuel economy values related to the generic Internal Combustion Engine (ICE) vehicles used for cost comparisons with electric vehicles.

You can select multiple vehicles from the list and select **Bulk edit** to change values for all selected vehicles.



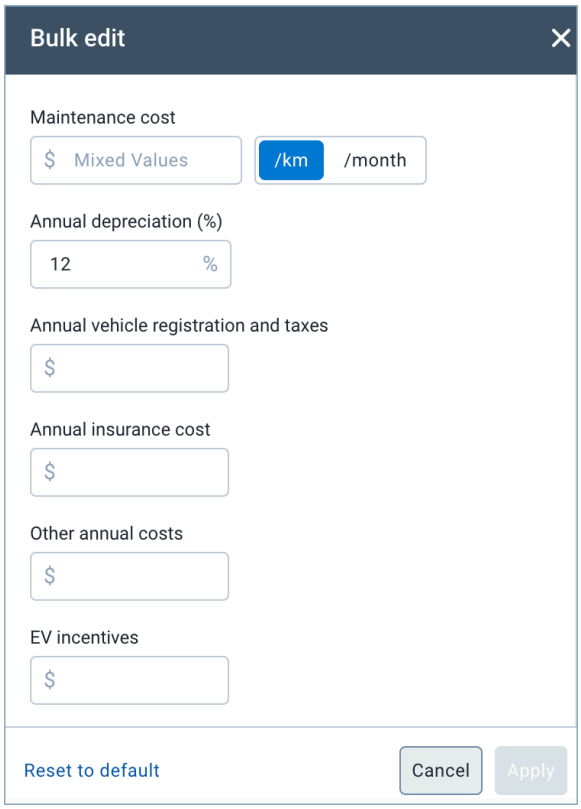
EV Costs

Under EV Costs, review the **Average electricity price** and update it if necessary.

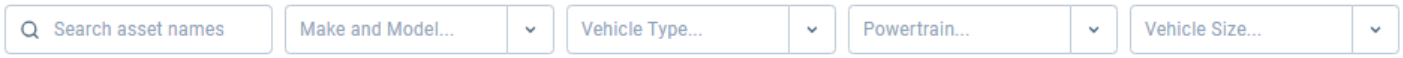


Click **EV Models Cost Estimates** to review and modify the estimated costs related to the electric vehicle models used in the assessment.

You can select multiple vehicles from the list and select **Bulk edit** to change values for all selected vehicles.

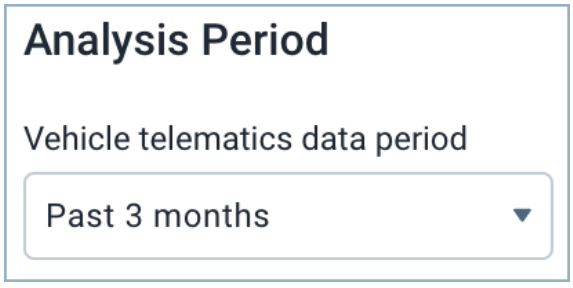


Use the filters if you need to narrow down your selection before using **Bulk edit**. You can filter by the EV make or model, vehicle type, powertrain, or vehicle size.



Analysis Period

Under Analysis Period, select the desired number of months from the dropdown menu to provide telematics data for the assessment. To accurately evaluate duty cycle and usage patterns for fleet vehicles, the assessment requires telematics data from the existing fleet vehicles.

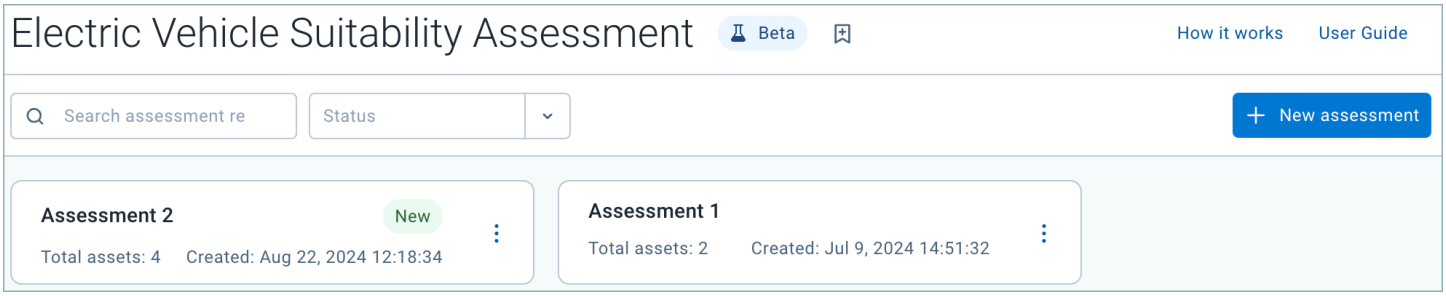


Click **Finish** button to submit the assessment for evaluation.

✱ **NOTE:** Vehicles should have at least one month of data collected in MyGeotab for a suitable recommendation. Fleets with seasonal drive cycles should run the EV Suitability Assessment using data collected over longer periods of time.

Viewing assessment results

The assessment recommendation report provides detailed summaries for the recommended electric vehicles. To open a specific assessment, click the assessment's tile from the **Electric Vehicle Suitability Assessment** page.



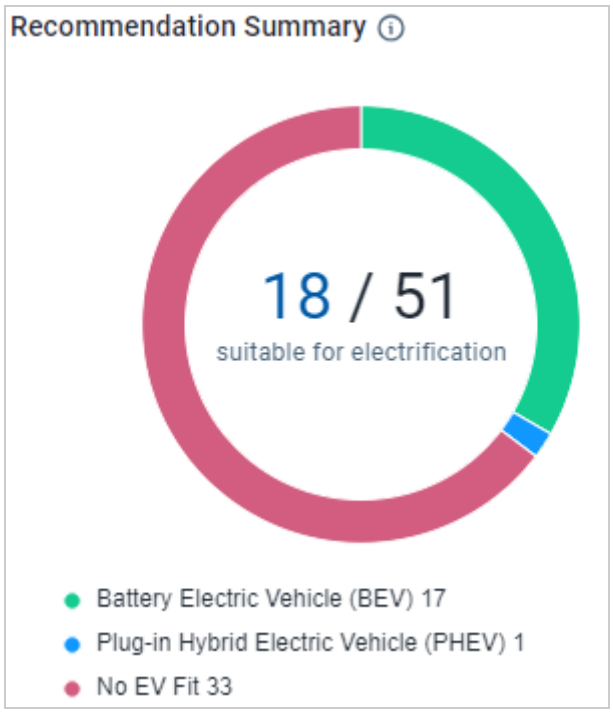
Each assessment is divided into three sections: **Summary**, **Recommended EV replacements**, and **Fleet vehicles without EV fit**. Select the tab corresponding to each section to view details.

Summary

Under the Summary tab, you can find several charts that summarize the assessment results.

Recommendation Summary

The chart under **Recommendation Summary** provides a quick overview of the assessment recommendations. The chart displays the number of vehicles assessed and the number of recommended vehicles based on vehicle type: Battery Electric Vehicles (BEV), Plug-in Hybrid Electric Vehicles (PHEV), and vehicles recommended for replacement by new non-electric vehicles.



✱ **NOTE:** For each vehicle selected in the assessment creation phase, an EV is recommended if the following conditions are true:

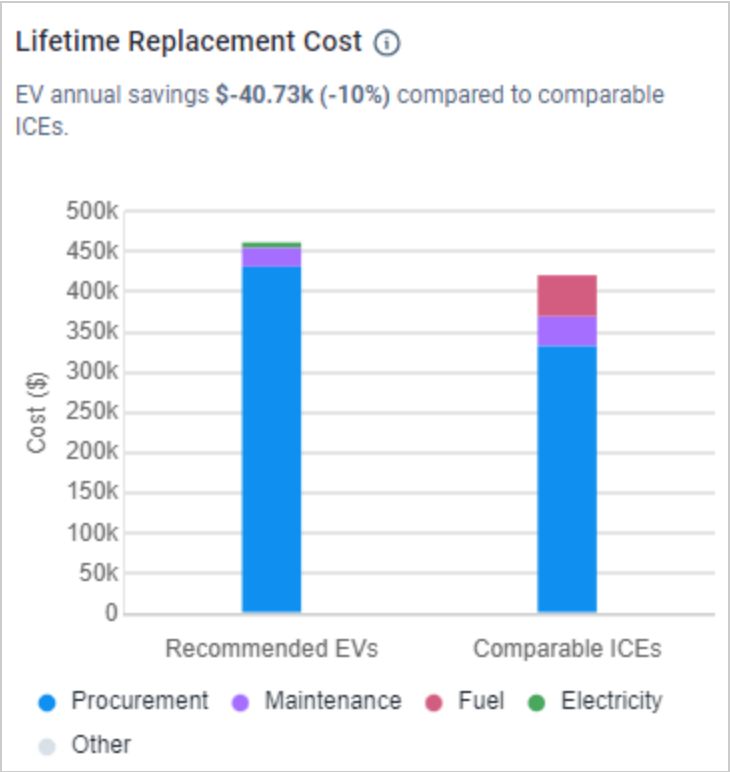
- The EV can fulfill the daily range requirements of the vehicle without the need to charge during the day beyond the allowed limit; and
- The lifetime cost of an EV is within the allowed limits compared to an equivalent non-EV.

Lifetime Replacement Cost

The chart under **Lifetime Replacement Cost** compares the lifetime costs of two scenarios:

- **Recommended EVs** — The sum of costs of the recommended BEVs and PHEVs.
- **Comparable ICEs** — The sum of costs of replacing the fleet vehicles that have a suitable EV replacement with new Internal Combustion Engine (ICE) vehicle.

The total cost is composed of the following categories: **Procurement**, **Maintenance**, **Fuel**, **Electricity**, and **Other**.



✱ **NOTE:** The **Other** category includes the following costs: vehicle registration and taxes, insurance, and low emission zone changes. The term **Lifetime** is based on the number of years selected on the **Preferences** page.

Annual Fuel and Electricity

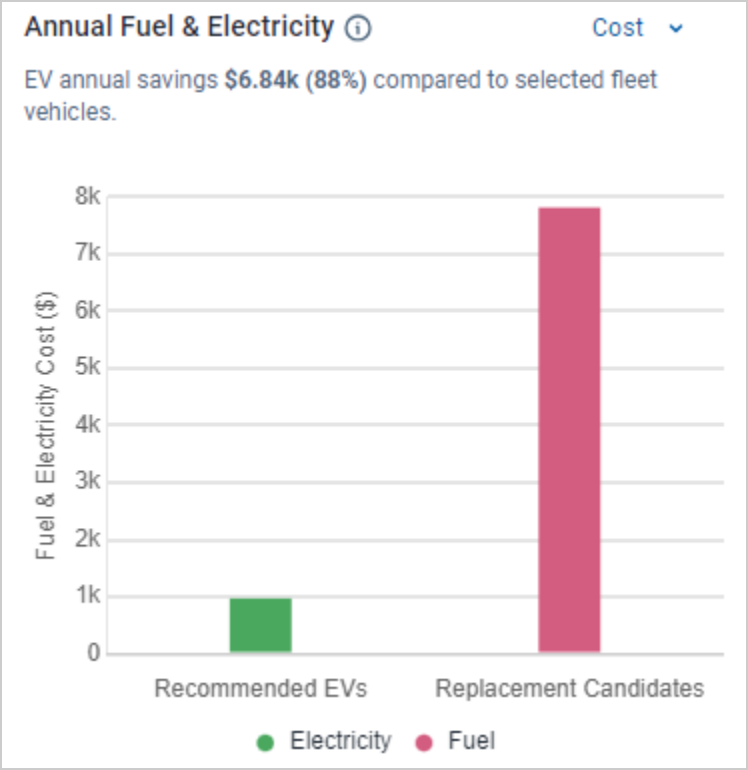
The chart under **Annual Fuel and Electricity** compares the annual energy costs or fuel volume of two scenarios: Recommended EVs and Replacement Candidates.

When **Cost** is selected, the cost for each scenario is computed as described below:

- **Recommended EVs** — The sum of fuel and electricity costs of the recommended BEVs and PHEVs EV replacement vehicles, averaged over a one-year period.
- **Replacement Candidates** — The total fuel costs of the selected fleet vehicles that have an EV replacement candidate, averaged over a period of one year.

When **Fuel Volume** is selected, the amounts for each scenario are computed as described below:

- **Recommended EVs** — The sum of the projected fuel consumption of the recommended PHEVs averaged over a period of one year.
- **Replacement Candidates** — The total projected fuel consumption of the selected fleet vehicles that have an EV replacement candidate, averaged over a period of one year.



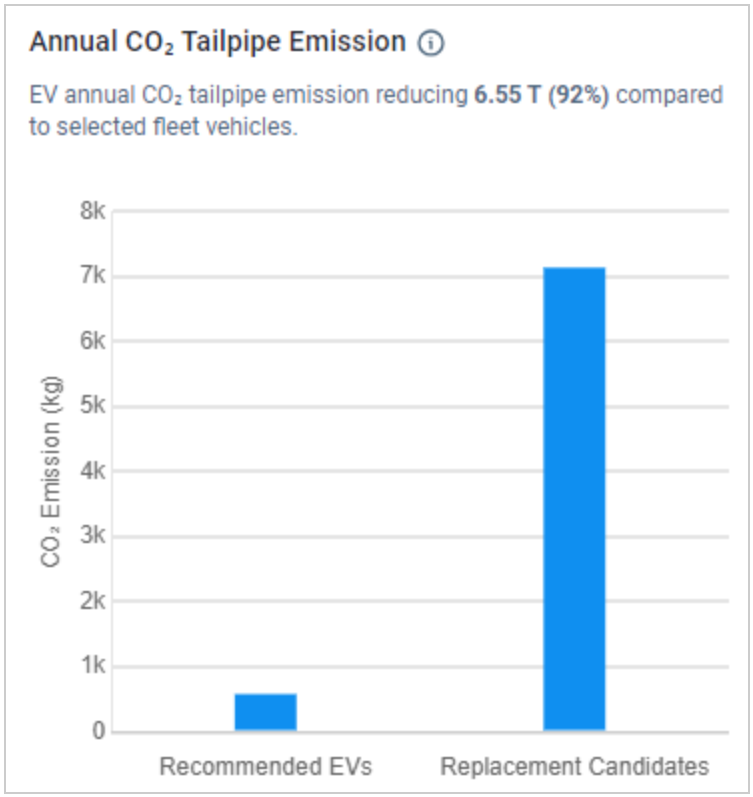
! IMPORTANT: The EVSA attempts to use the actual fuel consumption from the vehicle when possible. If a vehicle does not report fuel consumption through the GO device, then a default fuel efficiency value is used for that vehicle.

Annual CO_2 Tailpipe Emissions

The chart under **Annual CO_2 Tailpipe Emissions** compares the annual carbon dioxide tailpipe emissions between two scenarios:

- **Recommended EVs** — The total projected CO_2 emissions of the recommended PHEVs averaged over a one-year period.
- **Replacement Candidates** — The total of CO_2 emissions of the vehicles that have an EV replacement candidate, averaged over a one-year period.

✱ **NOTE:** Battery Electric Vehicles are not considered because they do not emit carbon dioxide.



Recommended EV replacements

The table under **Recommended EV replacements** lists all vehicles that have a suitable EV recommendation, either a BEV or PHEV. For each vehicle, the table displays the following data:

- **Vehicle name** — Name of existing non-EV.
- **Year, Make, Model** — Year and vehicle model of existing non-EV (from MyGeotab).
- **Vehicle type** — Vehicle type of existing non-EV.
- **Recommended EV** — EV recommended as a replacement for existing non-EV.
- **Powertrain** — The powertrain of the EV recommended for replacement, either a BEV or PHEV.
- **En-route charging events due to distance** — The number of days when the BEV fails to fulfill the range requirements without having to charge during the day, either due to long trips or due to insufficient charging time before making the trips.
- **Lifetime savings** — Projected savings of recommended EV compared to new non-EV replacement.

Click **View details** after the last row to open more information about **Range Assurance** and **Lifetime Cost**.

Asset na...	Year, Ma...	Vehicle t...	Recomm...	Powertra...	En-route ...	Lifetime ...	Note	
Gasoline or ...	2022 Volv...	SUV	Ford Kuga	Plug-in Hy...	0	860.38		View details
Vehicle	2015 Chev...	Passenger	Toyota Pri...	Plug-in Hy...	0	1150.64		View details
Vehicle	2020 Hyun...	SUV	Ford Kuga	Plug-in Hy...	0	860.38		View details

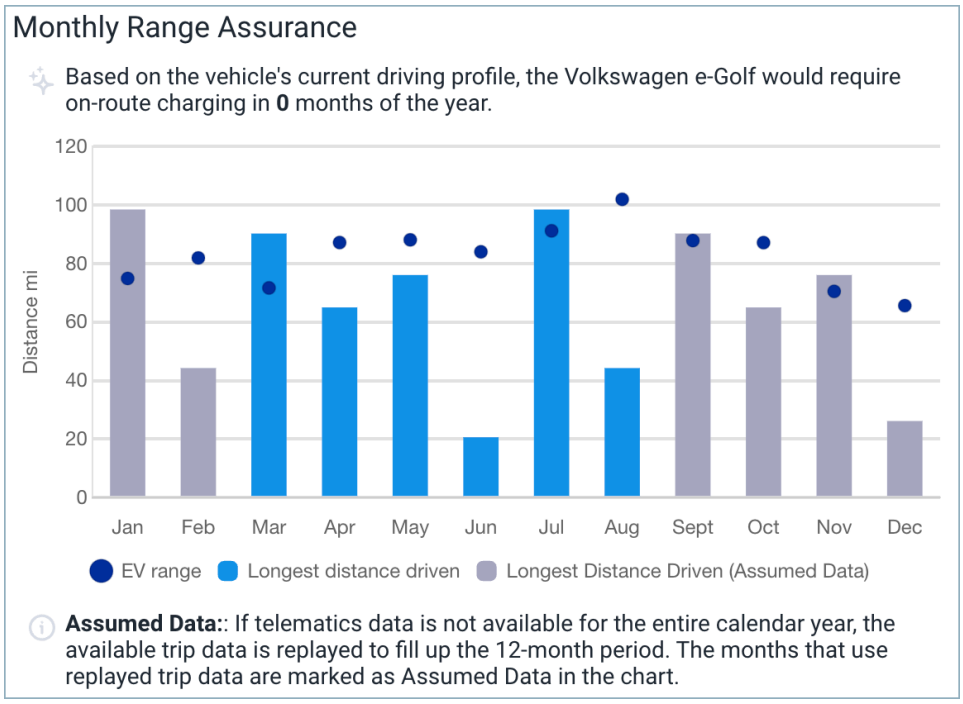
Monthly Range Assurance

The **Monthly Range Assurance** chart gives Fleet Managers the ability to understand, based on the current Internal Combustion Engine (ICE) vehicle's driving activity, the range capability of the recommended Electric Vehicle throughout the year.

The chart shows, for every calendar month, the following data points:

- The longest daily distance driven by the selected ICE vehicle.
- The range of the recommended EV, factoring in the average monthly temperature of where the vehicle is driven.
- The monthly average temperature of the region where the vehicle is driven the most.

If the assessed fleet vehicle does not report trip data for 12 calendar months, then the EVSA will replay trips from other months to cover the entire year. The months that have trip data filled from trips occurring in other months are labeled as **Assumed Data** on the chart.



The accompanying **Monthly en-route charging events** chart tracks the number of times the recommended EV would need to charge en-route before being able to return to a charge-capable location.

✱ **NOTE:** By default, an EV is considered the best fit when the no en-route charging events are required in any calendar month. The user may change this behavior by specifying the number of acceptable en-route charging events per month using the **En-route charging** setting under **Preferences**.

Fleet vehicles without EV fit

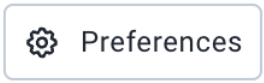
The table under **Fleet vehicles without EV fit** lists all the vehicles that do not have a suitable EV recommendation, if the following conditions are true:

- The EV cannot fulfill the daily driving range requirements — compared with the EV range under local monthly conditions.
- The EV does not have lifetime savings that are within a predefined limit compared to an equivalent non-EV.

Customize Preferences

To modify the preferences for a specific assessment:

1. Open the assessment.
2. Click **Preferences**.



3. From the side panel, modify the report preferences and customize it to suit your requirements.

EV Fit Preference

With the **Prioritize BEV over PHEV** option, the EV Suitability Assessment recommends a BEV over a PHEV when both options result in positive lifetime cost saving, even if the BEV option has lower lifetime cost savings compared to the PHEV.

EV Premium

EV Premium refers to the additional lifetime amount that you are willing to spend for an EV compared to a new equivalent non-EV. If lifetime savings are not a primary factor in your decision, you have the option to instruct the EVSA to recommend EVs, even when the EV lifetime cost savings is negative when compared to a new equivalent non-EV.

For example, if the lifetime cost of an EV is $ 4000 more than a new equivalent non-EV, the EV is not recommended by default. If an **EV Premium** value of $4000 or more is entered, then the EV is recommended for that vehicle.

En-Route Charging

By default, the EVSA does not recommend vehicles that cannot perform their longest driven daily route on a single charge of a full battery. The **En-Route Charging** option allows you to specify the number of days per month when it is acceptable for a vehicle to have to stop and recharge during operational hours.

For example, if a vehicle listed in the **Fleet vehicles without EV fit** table has positive EV lifetime savings, but the **En-Route charging count** is 3, it means that an EV was not recommended for that vehicle because the EV is projected to require an en-route charge for three days in a calendar month.

Warnings and Exceptions

The table below provides more information about the warnings and exceptions that the EV Suitability Assessment may encounter while processing fleet data. The warnings and exceptions can be reviewed in the detailed recommendation table — if raised for any fleet vehicle.

Warning/Exception	Description
No data from vehicle	MyGeotab API did not return trip data within the assessment time frame. In this case, the vehicle is considered to have no suitable EV fit.
Not enough data	Less than 3 weeks have passed since the vehicle device activated to the report end time. In this case, the assessment is run, and a warning is raised.

No fuel data	The vehicle does not support fuel consumption. In this case, the assessment is run using a default fuel efficiency value for the vehicle and a warning is raised.
VIN missing	The vehicle Make/Model/Year is not available because the VIN is missing in MyGeotab. In this case, the assessment is run, and a warning is raised.
Unidentified vehicle	The vehicle Make/Model/Year is not available because the VIN cannot be decoded by the MyGeotab VIN decoder. In this case, the assessment is run, and a warning is raised.

FAQ

For more information about the **Electric Vehicle Suitability Assessment** tool, please see the EVSA FAQ.