



X-Scape

Your Guide to Sustainable
Transportation Solutions
for a Greener Future.

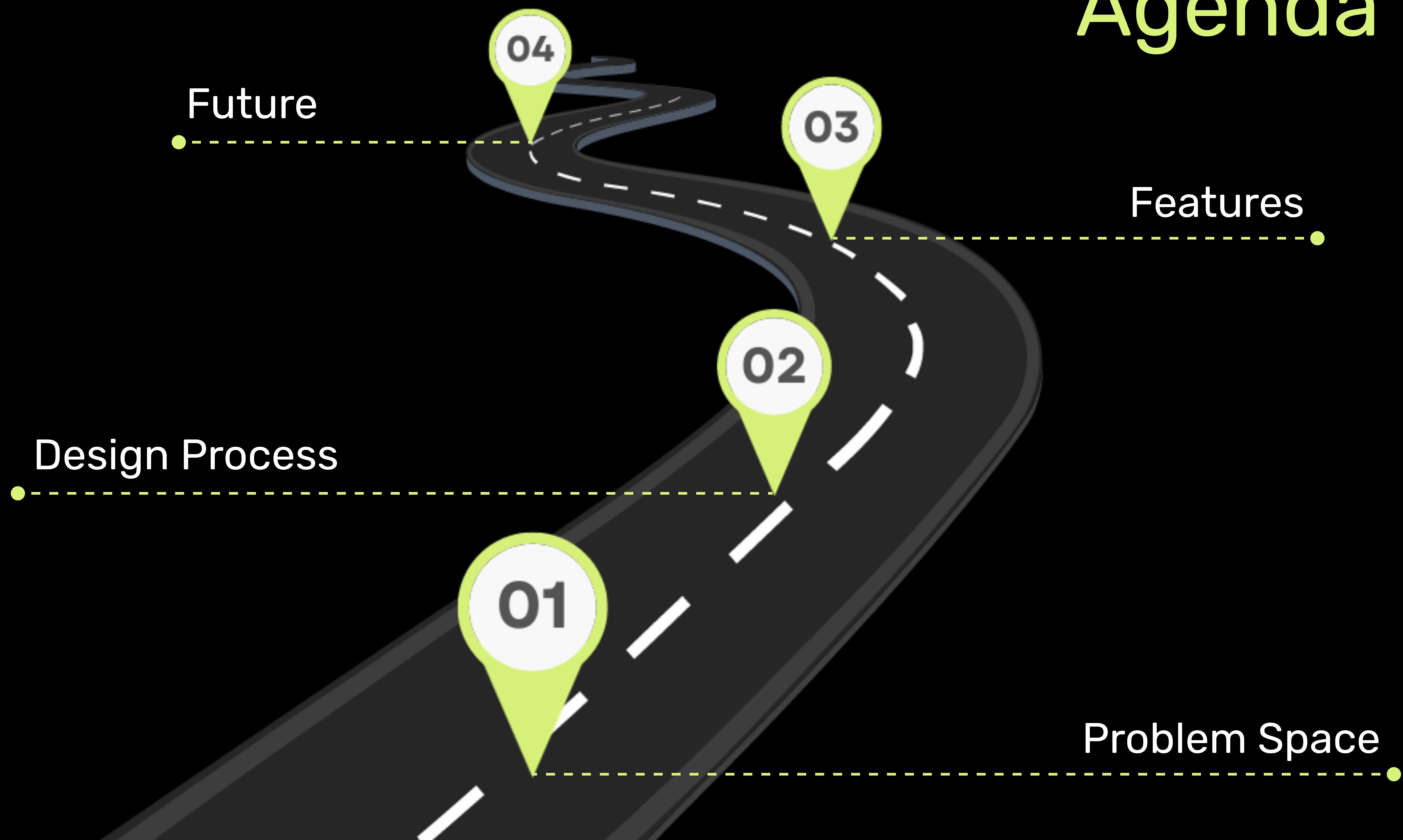


Group 2:
Arianna Khan, Stephanie Wang, Ethan Wang, Cici Zhao, Ella Tao



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Agenda





01

Problem Space



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UNSD Focus Area

United Nations Sustainable
Development Goal 11:
Sustainable Cities and Communities

11.2: Emphasizes the need to promote and provide
sustainable transport systems





Carbon Emissions

“**Cities** occupy just 3% of the Earth’s land, but **account for 75% of carbon emissions**” (UN SDG)

What are Carbon Emissions?

- Carbon dioxide enters the atmosphere through burning fossil fuels (coal, natural gas, and oil)
- Fossil fuels – coal, oil and gas – are by far the largest contributor to global climate change, accounting for over 75 per cent of global greenhouse gas emissions and nearly 90 per cent of all carbon dioxide emissions (UN.ORG)



What is Global Warming?

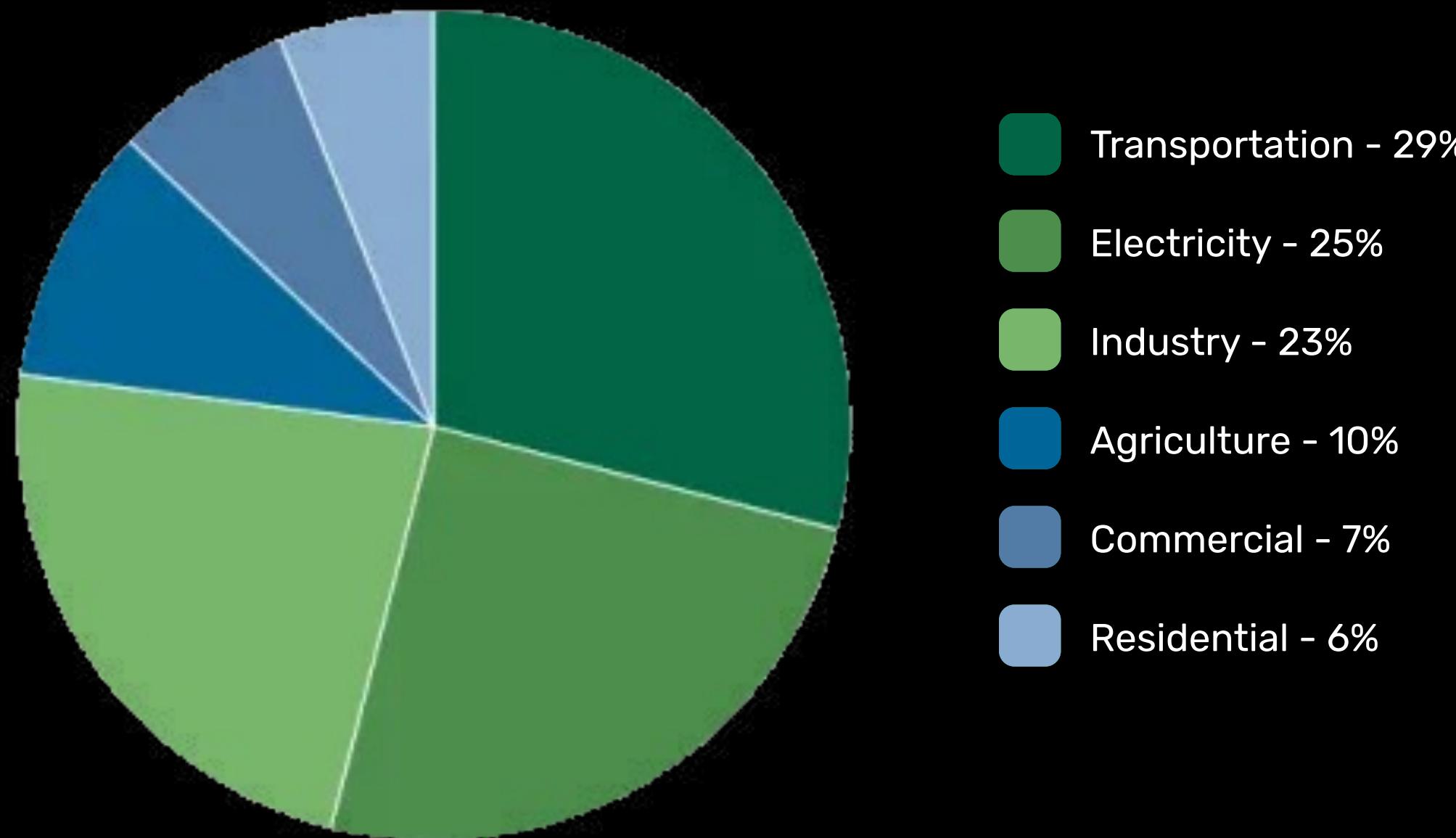
- As greenhouse gas emissions blanket the Earth, they trap the sun’s heat. This leads to global warming and climate change
- The world is now warming faster than at any point in recorded history. Warmer temperatures over time are changing weather patterns and disrupting the usual balance of nature. This poses many risks to human beings and all other forms of life on Earth



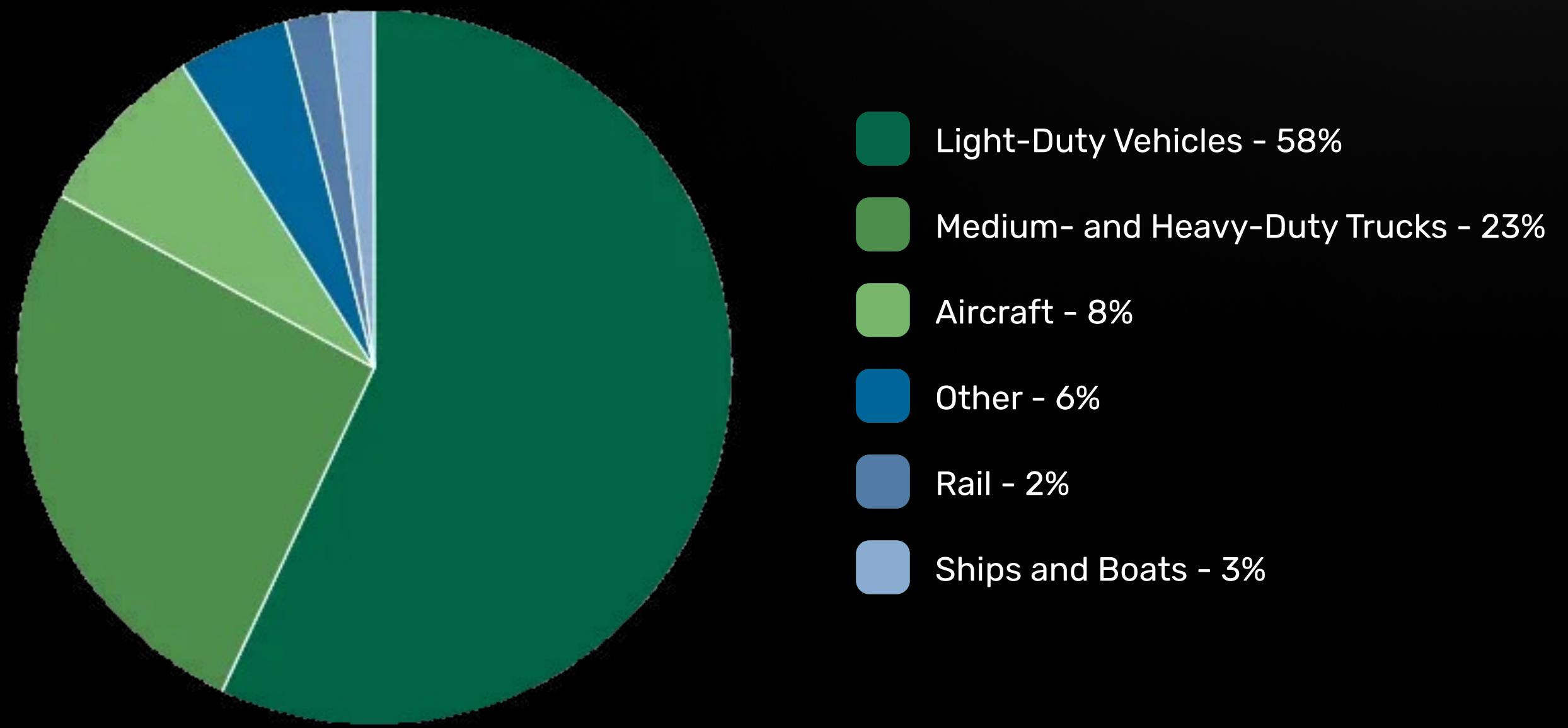
Transportation

"Greenhouse gas (GHG) emissions from transportation account for about 29 percent of total U.S. greenhouse gas emissions, making it the largest contributor of U.S. GHG emissions." ([US EPA](#))

2021 U.S. GHG Emissions by Sector



2021 U.S. Transportation Sector GHG Emissions by Source



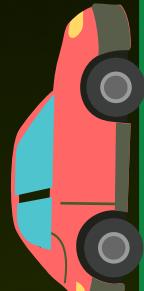


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Why EVs?

EVs:

- Significantly reduce carbon emissions & contribute to a cleaner environment to helping combat climate change
- Consume less gasoline, saving money on fuel costs and reducing carbon footprint
- Produce zero tailpipe emissions*, making them an excellent choice for environmentally-conscious individuals



*Tailpipe emissions are the product of fuel combustion (gasoline, diesel or other liquefied fuel or bio fuel) and comprise a number of pollutants such as carbon monoxide and carbon dioxide, hydrocarbons, nitrogen oxides, particulate matter, and certain pollutants like sulfur



Why EVs?

By choosing a fuel-efficient or electric car, you **reduce your personal impact on the environment** and enjoy **economic and environmental benefits** that positively impact your daily life.

95%

of **CO2 emissions** in cities
come from **motor vehicle exhaust**

60%

is the **average savings** that EV drivers
save on fuel costs compared to gas cars

4.2 million

premature deaths worldwide each year
due to poor air quality **from CO2 emissions**

4.6 metric tons

of **CO2** is emitted on average for
every **passenger vehicle** per year

Problem Statement

How might we **inform** young adult **car buyers** in King County about carbon emissions from various types of cars to help them **minimize** the environmental impact of their commutes?





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User Persona #1



Emily Shrader

AGE

24

LOCATION

King County, WA

OCCUPATION

Environmental Science Teacher

BACKGROUND

- Emily has a strong passion for environmental conservation and education
- She regularly participates in community initiatives focused on sustainability
- Has been using public transport but now needs a personal vehicle for greater mobility

GOALS

- To purchase a car that aligns with her environmental values
- To increase her understanding of the environmental impact of different types of cars
- To become an informed advocate for sustainable transportation options

NEEDS

- Reliable information about the carbon emissions of various car models
- Tools to compare different cars based on environmental impact and practicality
- A user-friendly platform that simplifies the technical aspects of car emissions

PAIN POINTS

- Difficulty in accessing concise and accurate information about car emissions
- The complexity of balancing environmental impact with budget and personal needs
- Navigating the overwhelming amount of data and jargon related to car emissions



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User Persona #2



Jordan Williams

AGE

23

LOCATION

King County, WA

OCCUPATION

Marketing Coordinator at a Tech Startup

BACKGROUND

- An enthusiastic young professional who's passionate about technology and innovation
- Recently moved to Seattle and is interested in the city's progressive and eco-friendly culture
- Busy lifestyle: commutes to work, weekend getaways, and occasional road trips with friends

GOALS

- Find a car that is efficient for city commuting + suitable for long-distance
- Understand environmental impact of his car choice and contribute to reducing carbon emissions
- Make well-informed purchase that aligns with his values and lifestyle

NEEDS

- Clear, accessible information on the environmental impact of various car models, focusing on urban use
- A simple way to compare the performance, cost, and carbon footprint of different cars

PAIN POINTS

- Limited understanding of car emissions and their environmental impact
- Difficulty in finding a car that is both eco-friendly and fits the needs of a city dweller
- Navigating the vast amount of information and marketing claims about 'green' vehicles

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02

Design Process

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Design Focuses

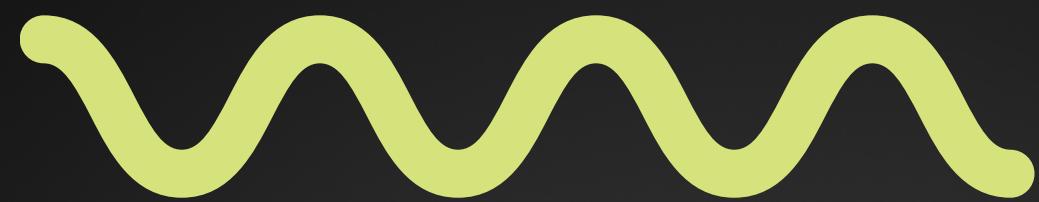
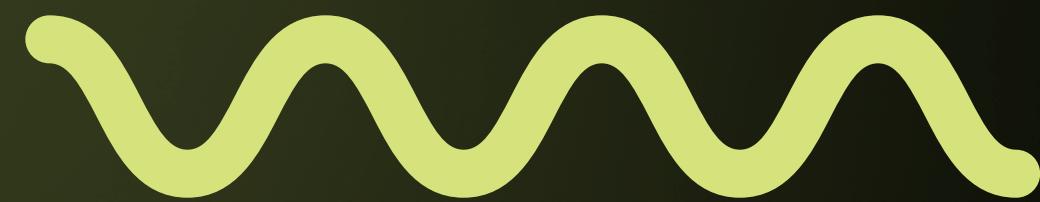
Usability

Engaging

Accessibility

Simplicity

Consistency





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Low Fidelity Wireframes

Carbon Emissions in King County Information

background information

Information on Types of Vehicles

background information / photos of different types of cars

Learn More Here:
link to video + external website

Make the right decision about your vehicle now.

HOME SEARCH COMPARE QUIZ SIGN-IN

This wireframe represents the initial user interface. It includes four main content boxes labeled 1 through 4, each containing placeholder text for 'background information'. Below these is a call-to-action message. The top navigation bar features standard links: HOME, SEARCH, COMPARE, QUIZ, and SIGN-IN.

Compare different types of cars!

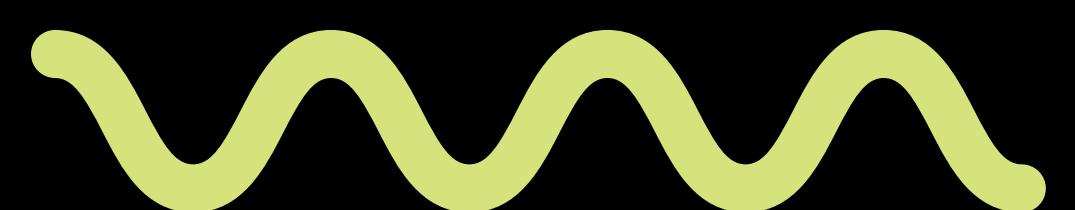
Car #1

Car #2

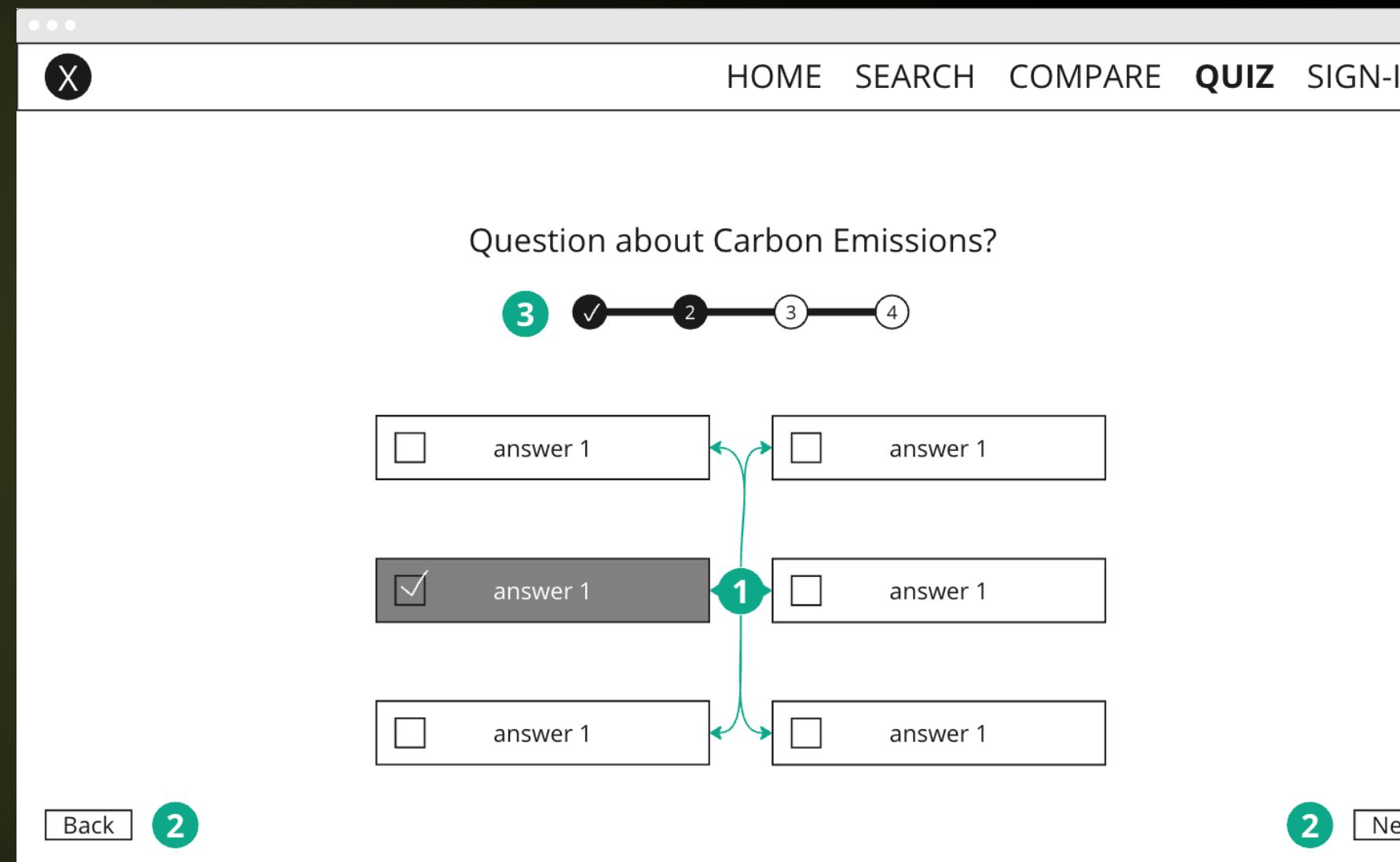
SUBMIT

car (make + model)	feature	feature	Type of Car (electric, gas, etc.)	carbon emissions
photo of car				
photo of car				

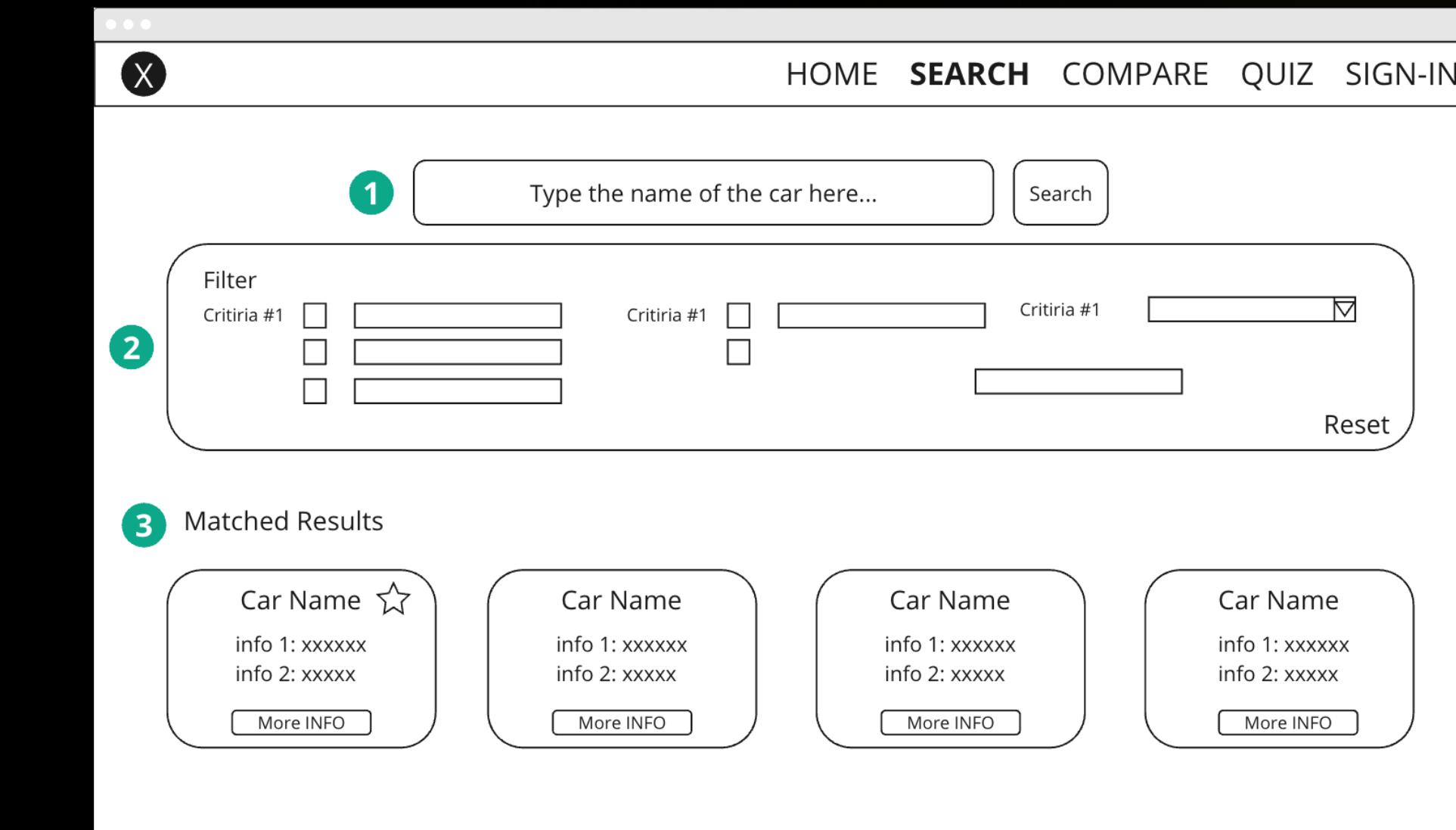
This wireframe shows the 'COMPARE' feature. It has two dropdown menus for selecting 'Car #1' and 'Car #2'. A large green button labeled 'SUBMIT' is positioned between them. Below these are two rows of a comparison table. The first row contains a placeholder 'photo of car' and empty columns for 'feature', 'feature', 'Type of Car (electric, gas, etc.)', and 'carbon emissions'. The second row also contains a placeholder 'photo of car' and empty columns for the same categories.



Low Fidelity Wireframes



A low-fidelity wireframe of a quiz interface. At the top, there's a navigation bar with links: HOME, SEARCH, COMPARE, QUIZ (which is bolded), and SIGN-IN. Below the navigation, a question is displayed: "Question about Carbon Emissions?". A progress bar shows step 3 completed (indicated by a green circle with a checkmark) and steps 2, 3, and 4 remaining (indicated by black circles). Below the progress bar are four answer boxes, each containing the text "answer 1". The second answer box from the top has a checked checkbox. A teal arrow points from the checked checkbox to the number "1" inside a teal circle, which is positioned between the second and third answer boxes. At the bottom left is a "Back" button with the number "2" in a teal circle, and at the bottom right is a "Next" button with the number "2" in a teal circle.



A low-fidelity wireframe of a search interface. At the top, there's a navigation bar with links: HOME, SEARCH (which is bolded), COMPARE, QUIZ, and SIGN-IN. Below the navigation, there's a search bar labeled "Type the name of the car here..." with a "Search" button to its right. A teal circle with the number "1" is placed next to the search bar. Below the search bar is a "Filter" section containing three rows of input fields labeled "Critiria #1". A teal circle with the number "2" is placed next to the first row of critiria. To the right of the filter section is a "Reset" button. Below the filter section is a heading "Matched Results" followed by four cards, each representing a search result for a car. Each card contains the text "Car Name" and a star icon, followed by "info 1: xxxxxx" and "info 2: xxxx", and a "More INFO" button. A teal circle with the number "3" is placed next to the first result card.



Gathering the Data

We sourced our carbon emission data from the U.S. Department of Energy and the images from Kelly Blue Book.

Cleaned dataset to remove unnecessary measurements + added columns like external link, images, and boolean values for car features (e.g. Apple CarPlay, etc.)

	A	B	C	D	E	F	G	
1	title	year	external_link	make	model	car_type	base_model	co2
2	2023 Chevrolet Bolt EV	2023	jet.com/electric/bolt-ev	Chevrolet		Bolt EV	EV	Bolt EV
3	2023 BMW i4 eDrive40 Gran Coupe	2023	ran-coupe/electric.html	BMW	i4 eDrive40 Gran Coupe	EV	i4	
4	2023 Tesla Model 3	2023	www.tesla.com/model3	Tesla	Model 3 RWD	EV	Model 3	
5	2023 Tesla Model Y Long Range	2023	www.tesla.com/modely	Tesla	Model Y Long Range AWD	EV	Model Y	
6	2023 Nissan LEAF	2023	s/lectric-cars/leaf.html	Nissan	LEAF	EV	LEAF	
7	2023 Audi Q4 e-tron	2023	ron/2024/overview.html	Audi	Q4 e-tron	EV	Q4 e-tron	
8	2023 Lexus RZ 450e	2023	v.lexus.com/models/RZ	Lexus	RZ 450e AWD	EV	RZ	
9	2023 Hyundai Ioniq 6 Long range	2023	/us/en/vehicles/ioniq-6	Hyundai	Ioniq 6 Long range AWD	EV	Ioniq 6	
10	2023 Polestar 2 Dual Motor	2023	istar.com/us/polestar-2/	Polestar	2 Dual Motor Perf Pack	EV	2	
11	2023 Volkswagen ID.4	2023	pm/en/models/id-4.html	Volkswagen	ID.4	EV	ID.4	
12	2023 Toyota Prius	2023	www.toyota.com/prius/	Toyota	Prius	Hybrid	Prius	
13	2023 Lexus NX 450h Plus	2023	com/models/NX-PHEV	Lexus	NX 450h Plus AWD	Hybrid	NX	
14	2023 Kia Niro	2023	www.kia.com/us/en/niro	Kia		Niro	Hybrid	Niro
15	2023 MINI Cooper SE Countryman	2023	/countrymanhybrid.html	MINI	Cooper SE Countryman All4	Hybrid	Countryman	
16	2023 Hyundai Santa Fe Plug-in Hybrid	2023	/santa-fe-plug-in-hybrid	Hyundai	Santa Fe Plug-in Hybrid	Hybrid	Santa Fe	
17	2023 Toyota RAV4 Prime	2023	toyota.com/rav4prime/	Toyota	RAV4 Prime 4WD	Hybrid	RAV4 Prime	
18	2023 Subaru Crosstrek Hybrid	2023	s/crosstrek/hybrid.html/	Subaru	Crosstrek Hybrid AWD	Hybrid	Crosstrek	
19	2023 Audi Q5 TFSI e quattro	2023	/q5/2024/overview.html	Audi	Q5 TFSI e quattro	Hybrid	Q5	
20	2023 Honda Accord Hybrid	2023	/hybrid#hybrid-upgrade	Honda	Accord Hybrid	Hybrid	Accord	
21	2023 Volvo XC60 T8 Recharge	2023	im/us/cars/xc60-hybrid/	Volvo	XC60 T8 AWD Recharge	Hybrid	XC60	
22	2023 Nissan Rogue	2023	sovers-suvs/rogue.html	Nissan	Rogue AWD	Gas	Rogue	
23	2023 Honda Accord	2023	nda.com/accord-sedan	Honda		Gas	Accord	
24	2023 MINI Cooper S	2023	om/model/hardtop.html	MINI	Cooper S Hardtop 2 door	Gas	Cooper	
25	2023 Honda CR-V	2023	nobiles.honda.com/cr-v	Honda	CR-V AWD	Gas	CR-V	
26	2023 Subaru Crosstrek	2023	/ehicles/crosstrek.html	Subaru	Crosstrek AWD	Gas	Crosstrek	
27	2023 Toyota Corolla	2023	www.toyota.com/corolla/	Toyota	Corolla	Gas	Corolla	
28	2023 Mazda CX-50	2023	l_w_wB&glsrc=a.w.ds	Mazda	CX-50 4WD	Gas	CX-50	
29	2023 Hyundai Elantra	2023	/us/en/vehicles/elantra	Hyundai	Elantra	Gas	Elantra	
30	2023 Subaru BRZ	2023	j.com/vehicles/brz.html	Subaru	BRZ	Gas	BRZ	
31	2023 Toyota Camry LE/SE	2023	www.toyota.com/camry/	Toyota	Camry LE/SE	Gas	Camry	

Converted file into json to import to our website.

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User Testing Findings

"The \$\$\$ made it hard to grasp what the price of the car is"

Added a info hover icon that explains the range of prices for each \$ sign

"Hard to search for a new car after already searching for one car"

Added a clear button in the search bar to easily restart and search for a new car

"Empty space looks weird on compare page when no cars are compared"

Added a message to help fill the empty space and provide instructions to the user on how to get started

"The 'More Info' button was not clear it led to an external website"

Renamed button to "Visit Website" and also added an external link icon

"Unclear on what to do when searching for a car not in the dataset"

Added an error message when no results found and instructed them how to fix it



03

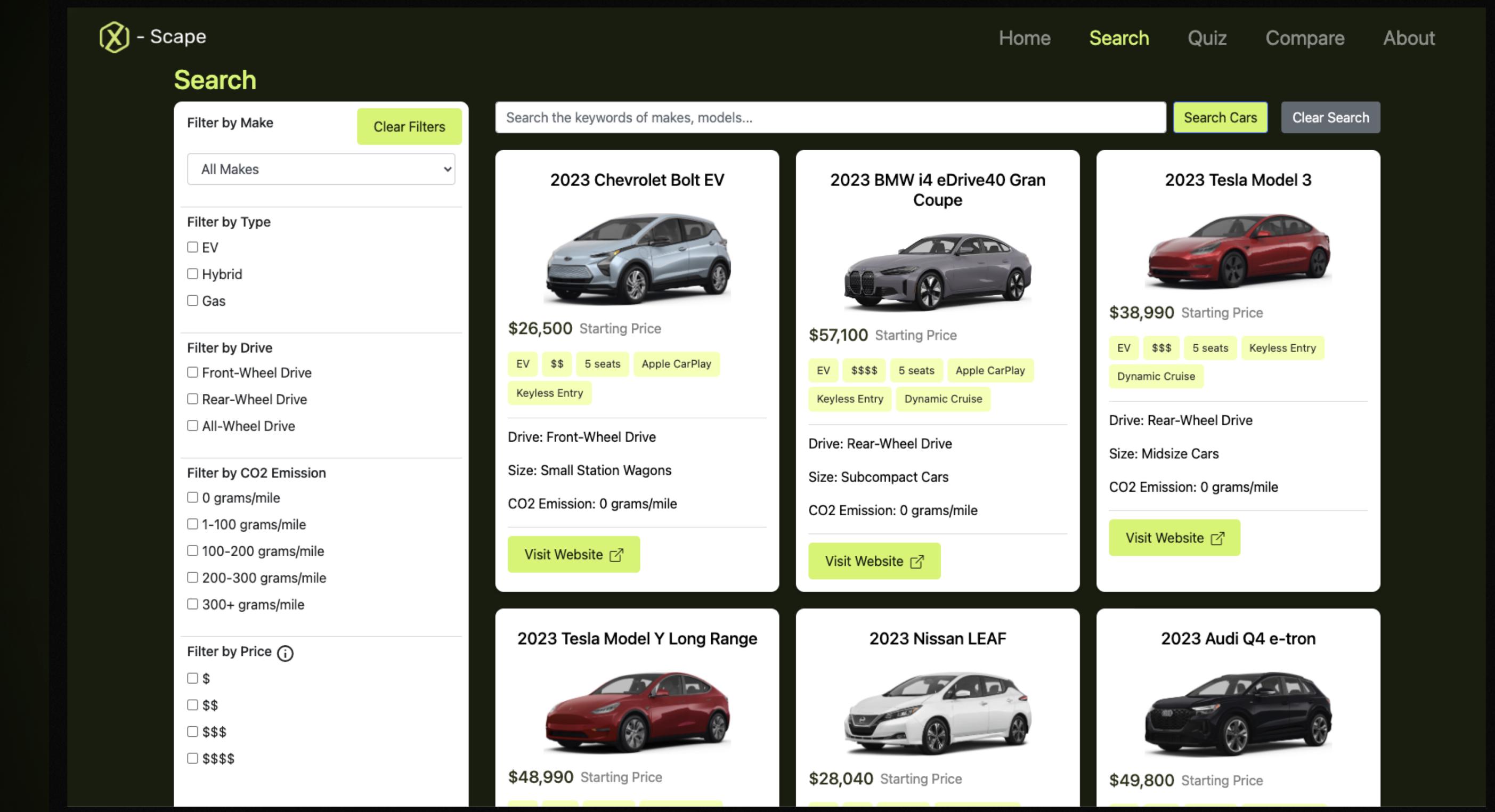
Features

Search and Filter

Users are met with a car card catalog where they can search and filter by their preferences.

Users can filter by:

- Make
- Model
- Type
- Drive
- CO2 Emissions
- Price



The screenshot shows the X-Scape search interface. On the left, there's a sidebar with filtering options: 'Filter by Make' (dropdown set to 'All Makes'), 'Clear Filters', 'Filter by Type' (checkboxes for EV, Hybrid, Gas), 'Filter by Drive' (checkboxes for Front-Wheel Drive, Rear-Wheel Drive, All-Wheel Drive), 'Filter by CO2 Emission' (checkboxes for 0, 1-100, 100-200, 200-300, 300+ grams/mile), and 'Filter by Price' (checkboxes for \$, \$\$, \$\$\$, \$\$\$\$). The main area displays a grid of six car cards:

- 2023 Chevrolet Bolt EV**: \$26,500 Starting Price. EV, \$\$, 5 seats, Apple CarPlay, Keyless Entry. Drive: Front-Wheel Drive. Size: Small Station Wagons. CO2 Emission: 0 grams/mile. [Visit Website](#)
- 2023 BMW i4 eDrive40 Gran Coupe**: \$57,100 Starting Price. EV, \$\$\$, 5 seats, Apple CarPlay, Keyless Entry, Dynamic Cruise. Drive: Rear-Wheel Drive. Size: Subcompact Cars. CO2 Emission: 0 grams/mile. [Visit Website](#)
- 2023 Tesla Model 3**: \$38,990 Starting Price. EV, \$\$\$, 5 seats, Keyless Entry, Dynamic Cruise. Drive: Rear-Wheel Drive. Size: Midsize Cars. CO2 Emission: 0 grams/mile. [Visit Website](#)
- 2023 Tesla Model Y Long Range**: \$48,990 Starting Price. EV, \$\$\$, 5 seats, Keyless Entry. Drive: Rear-Wheel Drive. Size: Midsize SUVs. CO2 Emission: 0 grams/mile. [Visit Website](#)
- 2023 Nissan LEAF**: \$28,040 Starting Price. EV, \$\$, 5 seats, Keyless Entry. Drive: Front-Wheel Drive. Size: Compact Cars. CO2 Emission: 0 grams/mile. [Visit Website](#)
- 2023 Audi Q4 e-tron**: \$49,800 Starting Price. EV, \$\$\$, 5 seats, Keyless Entry. Drive: All-Wheel Drive. Size: Compact SUVs. CO2 Emission: 0 grams/mile. [Visit Website](#)

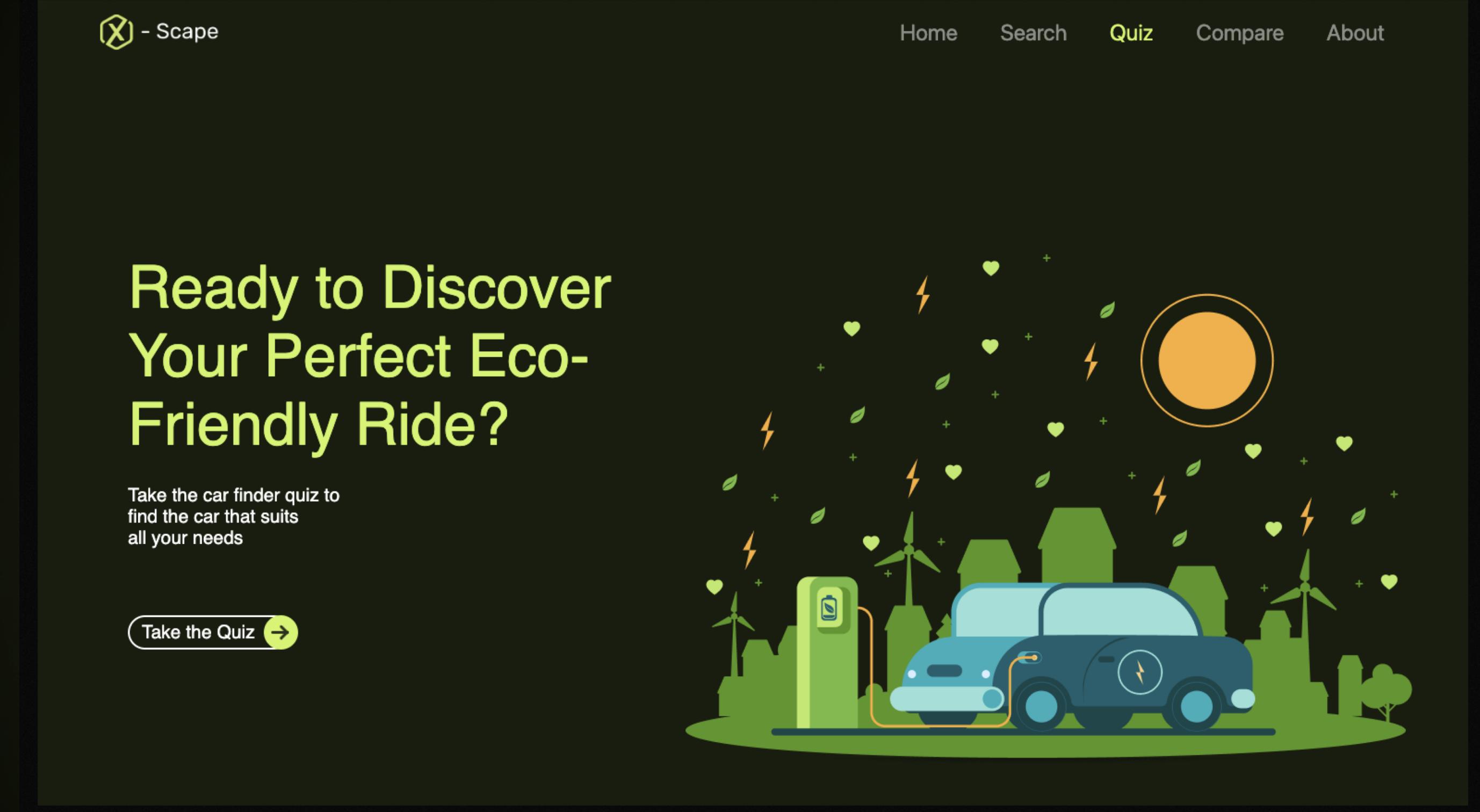
At the top right, there are links for Home, Search, Quiz, Compare, and About. A search bar at the top has placeholder text 'Search the keywords of makes, models...' and buttons for 'Search Cars' and 'Clear Search'.

Personalized Quiz

Users can take a quiz to obtain personalized recommendations.

Questions asks users about their preferences on:

- Price range
- Car type
- Fuel efficiency
- CO2 emissions
- Cost savings



The screenshot shows a dark-themed mobile application interface. At the top, there is a navigation bar with the 'Scape' logo on the left and five menu items: Home, Search, Quiz, Compare, and About. The 'Quiz' item is highlighted with a green background. Below the navigation bar, the main content area features a large, bold title 'Ready to Discover Your Perfect Eco-Friendly Ride?' in white text. Underneath the title, there is a subtitle in smaller white text: 'Take the car finder quiz to find the car that suits all your needs'. At the bottom of this section is a blue button with the text 'Take the Quiz' and a right-pointing arrow. To the right of the text area is a colorful illustration of a blue electric car connected to a green charging station. The background of the illustration is a green landscape with wind turbines, trees, and a bright orange sun in the sky. The overall aesthetic is clean and modern, emphasizing environmental themes.



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Comparison Table

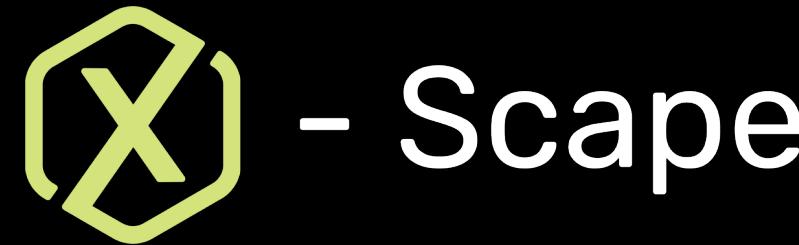
Users are met with an option to select two different types of car to compare.

Buttons will be disabled if <2 cars are selected.

Compare

2023 Honda Accord Hybrid 2023 Subaru BRZ Apply Search Clear Filters

Model	 2023 Honda Accord Hybrid	 2023 Subaru BRZ
Price	\$31,345	\$28,595
Classification	Hybrid	Gas
Drive Type	Front-Wheel Drive	Rear-Wheel Drive
Carbon Emissions	184 grams/mile	398 grams/mile
Apple CarPlay	✓	✗
Keyless Entry	✓	✗
Dynamic Cruise Control	✓	✗



Live Demo:

<https://xscape.web.app/>



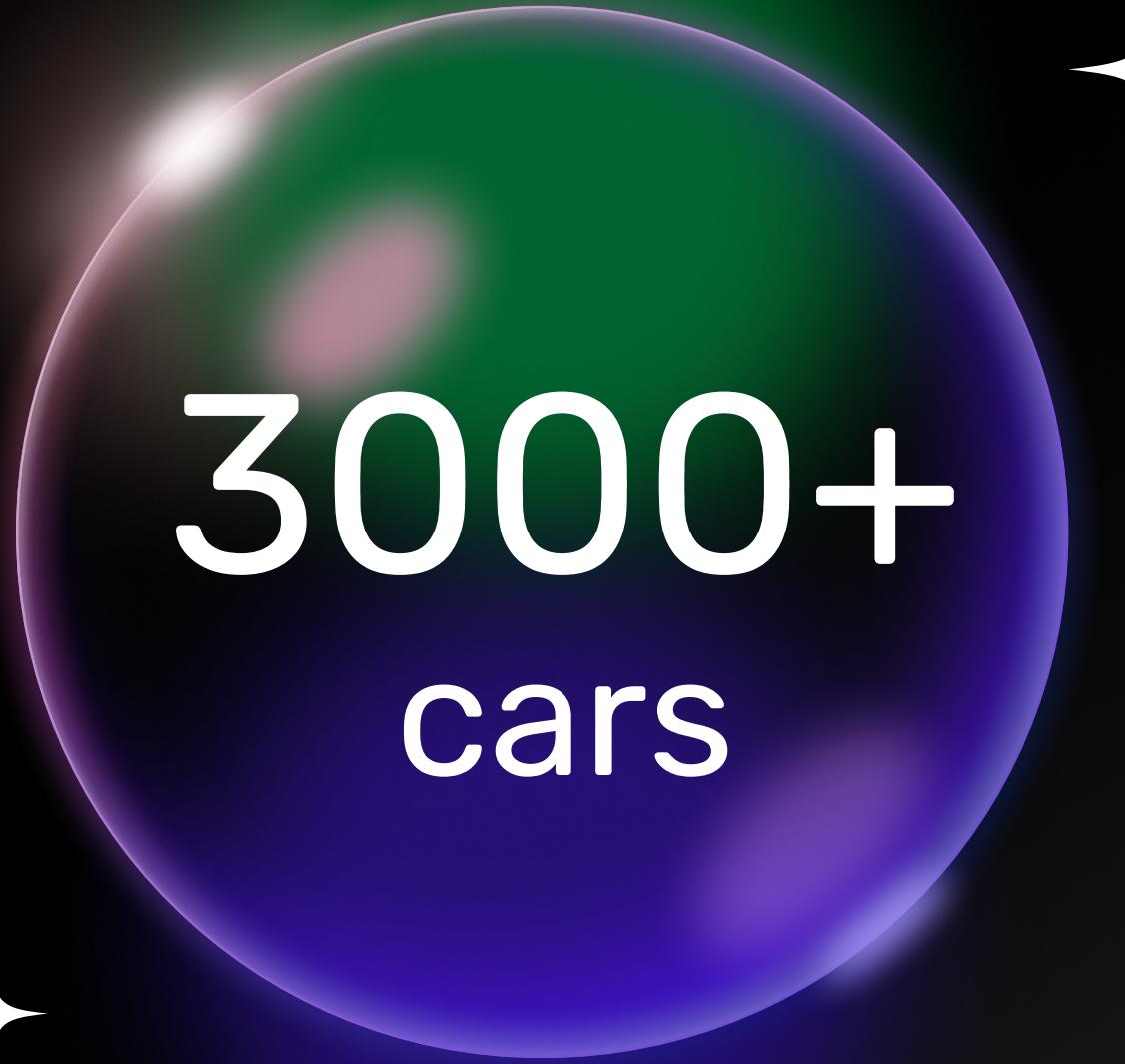


04

Future

Future Perspective

Expand dataset and store data in a database



3000+
cars



30+
cars



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Advanced Search

User Profile

UI/UX Improvement

AI Vehicle Advisor

Improve

Features

Q & A

Q: How did you decide which vehicles to include in the dataset?

85% of our chosen vehicles are under 50k, and we choose 10 cars for EVs, 10 cars for Hybrid Vehicles, and 10 cars for Gas Vehicles.

Q: Why is there no user Sign-in/Login ?

For now, we want users to access the website without login barriers. In current stage, the primary goal of our website is to educate and inform rather than to capture user data or personalized content.

Q: How will you measure the impact of the website on users?

The number of user clicks on "External Website", meaning that our website leads users to explore cars that are suitable for them.