Jaunt

Feasibility Study of Alternative Fueled Buses

Advisory Committee Meeting 1: June 27, 2022

Jaunt
WHERE CAN WE TAKE YOU?

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Expect More. Experience Better.

Agenda

- Introductions
- Overview of Project
  - FTA Requirements
  - Project Tasks
  - Roles & Responsibilities
  - Project Schedule
- Project Goals
- Technology Overview
- Questions & Discussion

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Introductions

Project Overview

- FTA “Lo-No” Funding:
  - Requirements (6 items)
  - Due May 31, 2023
- DRPT Goals (E&M Study)
- Project Tasks:
  1. Project Management
  2. Feasibility Study
  3. Stakeholder Coordination

1. Long-term fleet management plan
2. Current and future resources
3. Policy and legislation
4. Existing and future facilities
5. Partnership with utility or fuel provider
6. Workforce transition

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Feasibility Study Elements

- Comparison of multiple fuel types, including:
  - Battery Electric
  - Compressed Natural Gas
- Peer agency interaction
- Presentation of tradeoffs, advantages, and disadvantages for technologies
- Start the relationship with utilities/fuel providers
- Impact of technology on operations and procurement
- Stakeholder Coordination:
  - 3 Advisory Group Meetings
  - 1 Jaunt Board Presentation of Findings

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Roles & Responsibilities

- Jaunt Staff and Advisory Committee
  - Provide strategic direction
  - Review and provide comments on deliverables
- Jaunt Staff
  - Provide agency data, technical input, and review
  - Support analysis and conceptual design
- Consultant Team
  - Guide project and decision-making processes
  - Aggregate and analyze client input
  - Produce planning and conceptual documentation

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Project Schedule

- Duration: Approximately 5 months after kickoff
- Key dates:
  - Jaunt budget process begins at end of 2022
  - DRPT MERIT Grants Due February 2023
  - Low-No and Bus Facilities Grants Due May 2023
- Two More Advisory Committee Meetings:
  - Existing Conditions and Opportunities: September 2022
  - Recommendations and Implementation Plan: November 2022
- Presentation to Jaunt Board of Directors: December 2022

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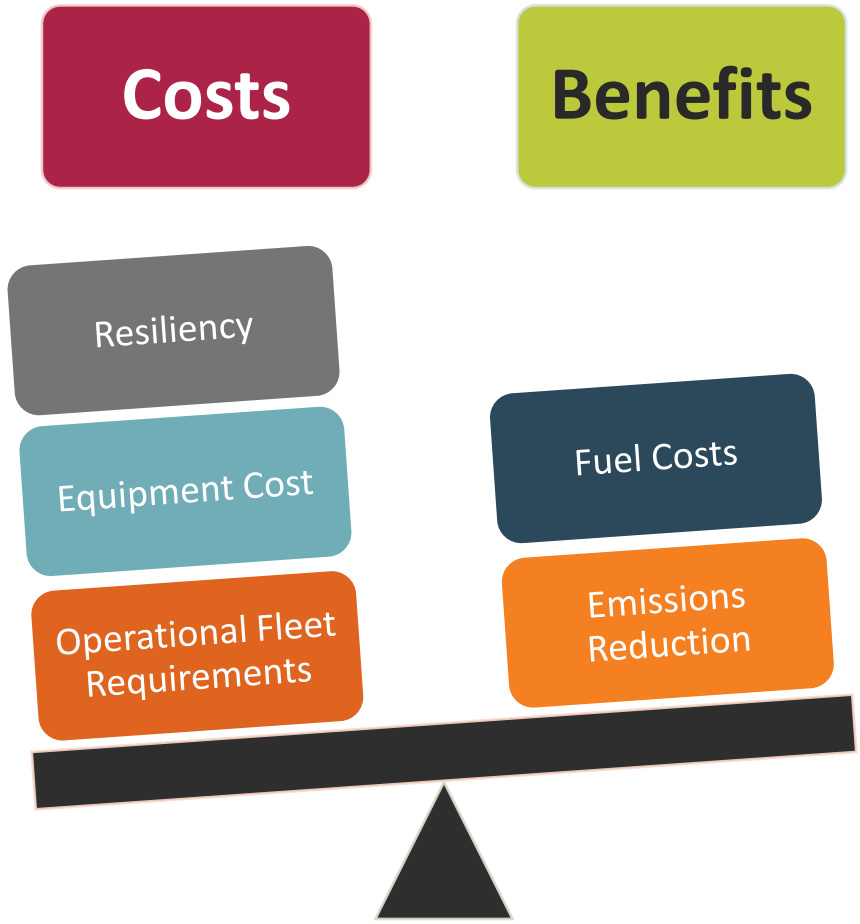
Project Goals

Comparisons and Tradeoffs

- Project will weigh costs and benefits for Jaunt
- Align outcomes and recommendations with goals
- Present scenarios for consideration
  - Single or combination of options
  - Quantify the impacts for emissions and costs



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Project Goals

- Achieve 30% GHG reduction by 2030; net zero by 2040
- Determine a preferred cleaner fuel type for Jaunt
  - Consider trade-offs including operating and capital cost, emissions impact, and operational viability
  - Balance the current level of service with practicality of low or no emissions vehicles (minimize impact to operations)
  - Consider well-to-wheel impact of propulsion technology on emissions
- Determine high level implementation strategy and timeline of the preferred fuel type

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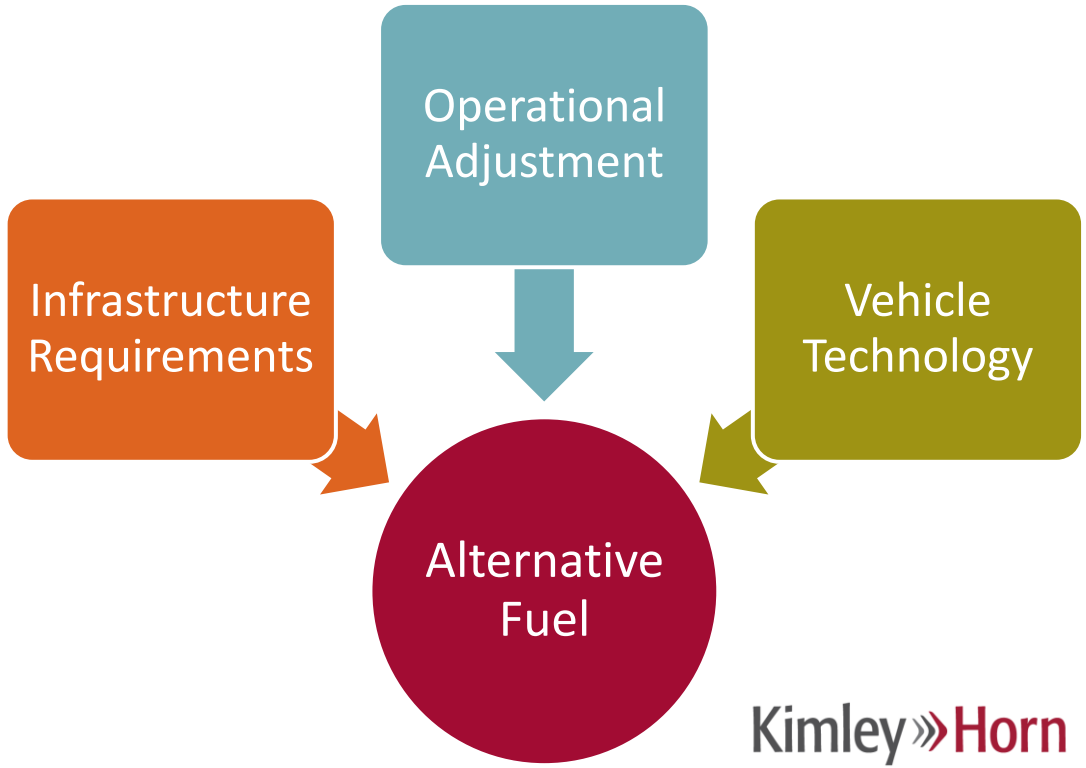
Technology Overview

Technologies

- ‘Traditional’ Diesel or Gasoline Fossil Fuel
- **Compressed Natural Gas (CNG)** – *Natural or Renewable*
- **Battery Electric**
- Others:
  - Hybrid Electric
  - Hydrogen Fuel Cell Electric
  - Propane (Liquified Petroleum Gas, LPG, or AutoGas)
  - Biodiesel



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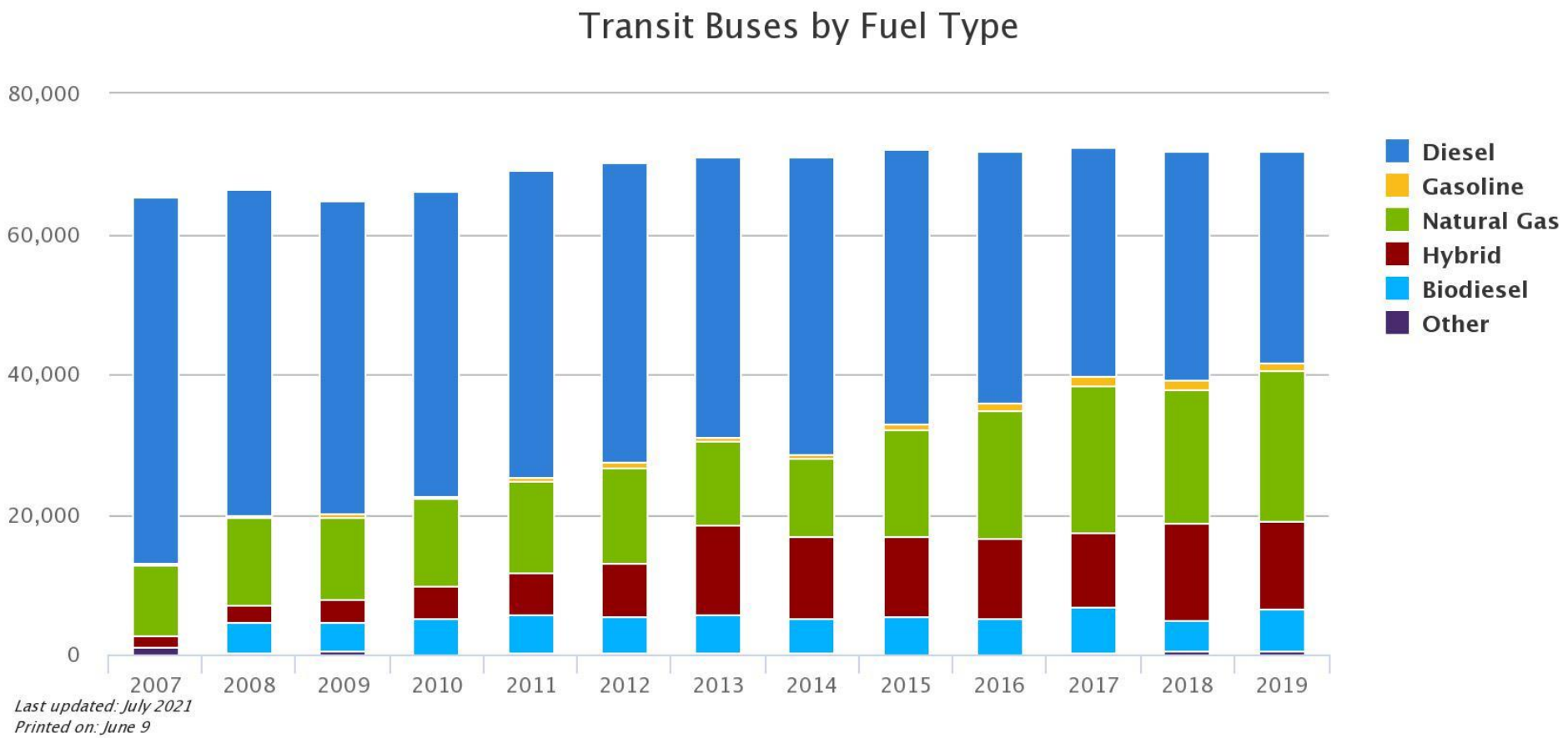
Current Share of Transit Bus Fuel Type



Source: Derived from Tables 21 and 34 in Appendix A of the 2020 Public Transportation Fact Book from the American Public Transportation Association
Notes: "Natural Gas" includes compressed and liquefied forms. "Other" up to 2007 included propane, bio/soy fuel, and biodiesel. After 2007, "Other" included battery-electric, hydrogen, and propane.

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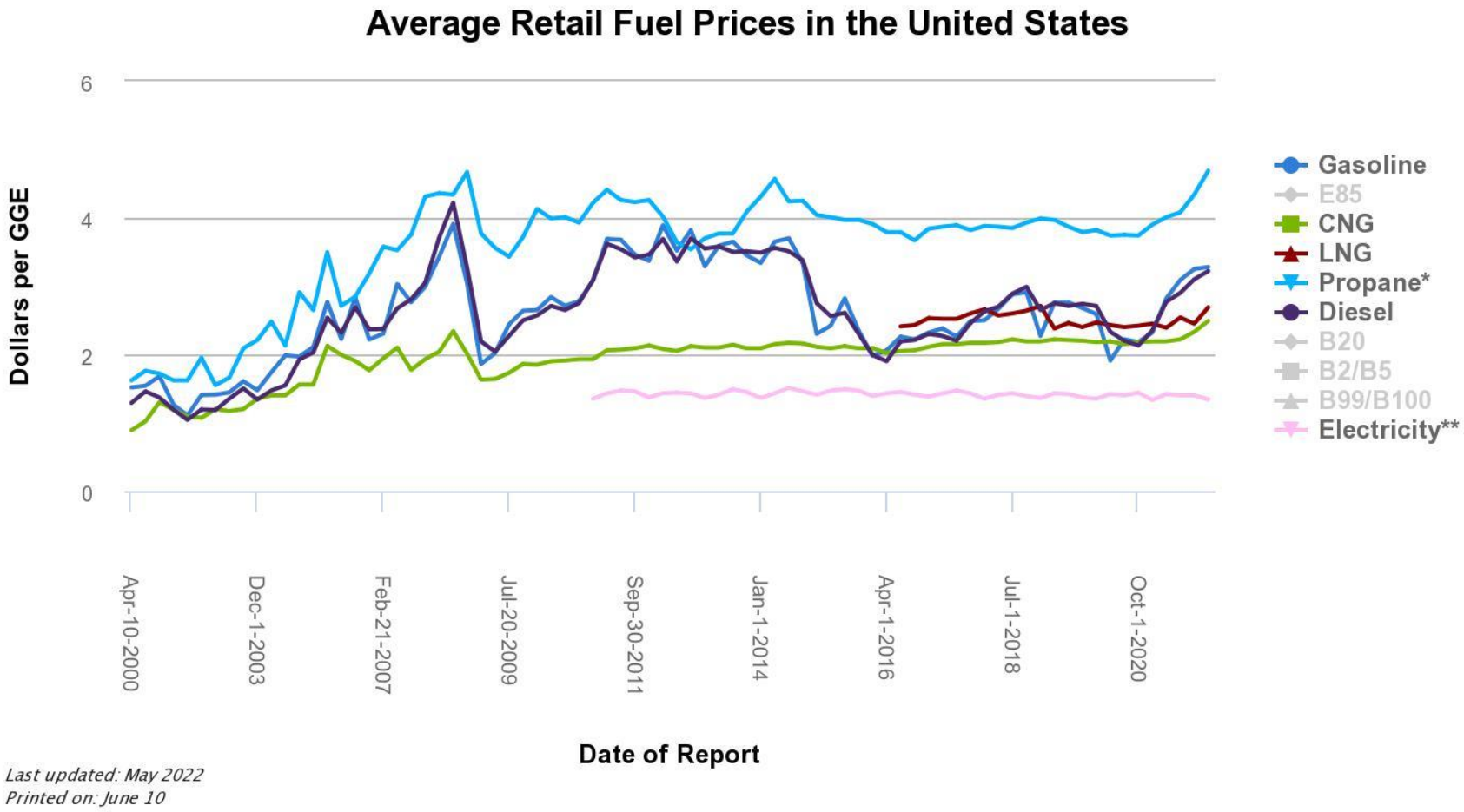
Cost of Fuel per Gasoline Gallon Equivalent (GGE)



Source: Clean Cities Alternative Fuel Price Reports | Electricity prices are from EIA's Real Prices Viewer.
Notes: Fuel volumes are measured in gasoline gallon equivalents (GGEs).

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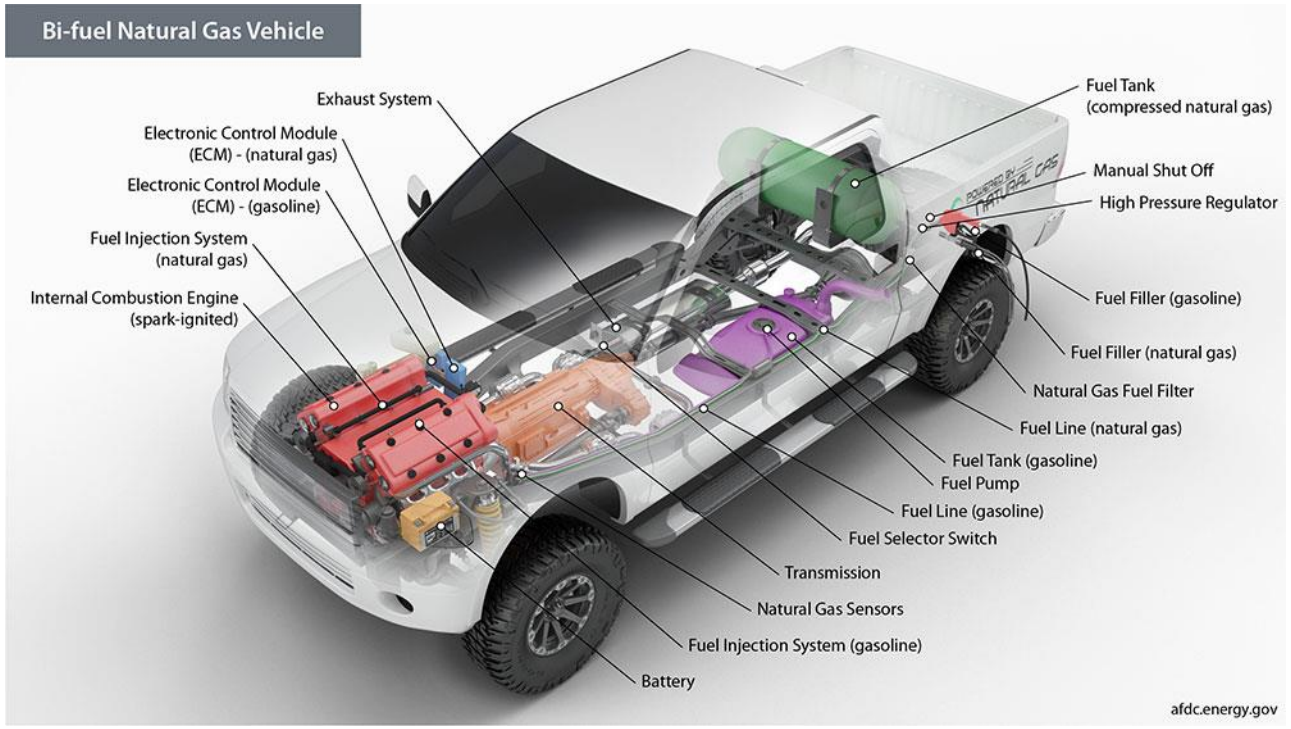
Compressed Natural Gas and Propane AutoGas

- Combustion-based fuel
- Similar to conventional gasoline and diesel vehicles (can even be bi-fuel)
- Range is similar to traditional
- Emissions are dependent on fuel sourcing
  - Natural Gas is primarily Methane and may be derived from fossil sources, anaerobic digesters, agriculture, or landfills
  - Propane can also be made renewably, or sourced as a fossil fuel



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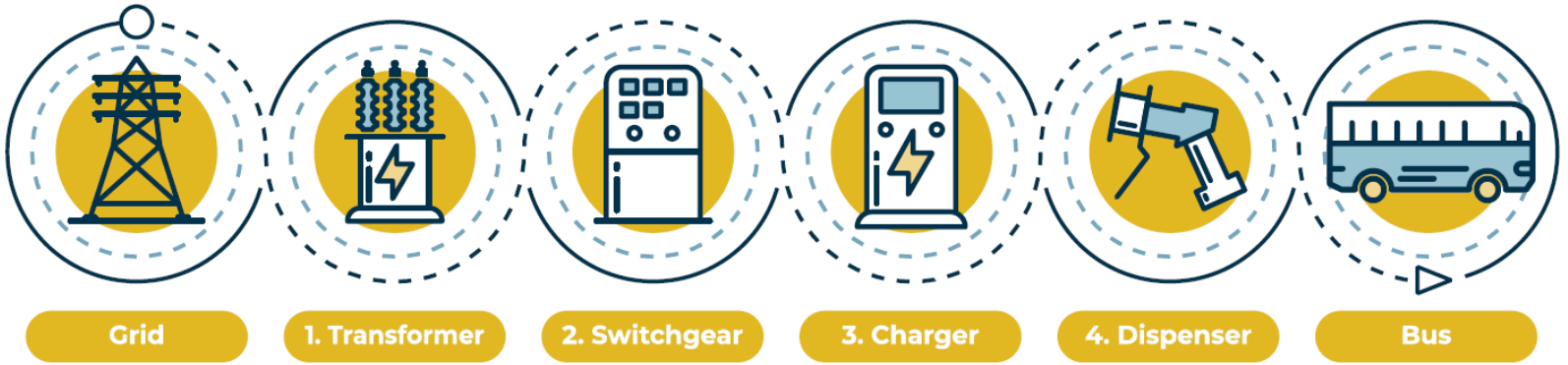
Battery Electric

- Non-combustion propulsion
- Range can vary based on equipment, weather, and a number of other factors, but most vehicle will perform 100-200 miles
- Can be supplemented with fossil fuel heating units to extend range in cold weather
- Emissions are dependent on electric grid generation source



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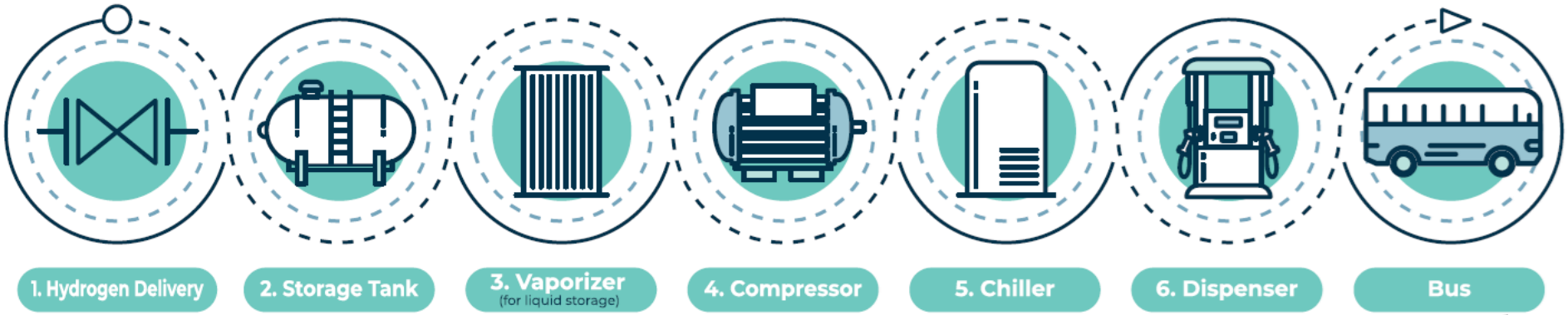
Hydrogen Fuel Cell

- Non-combustion propulsion, similar to Battery Electric
- Fuel is either gaseous or liquified hydrogen
- Range varies based on operating conditions, though generally in parity with traditional diesel vehicles
- Emissions are highly dependent on hydrogen generation



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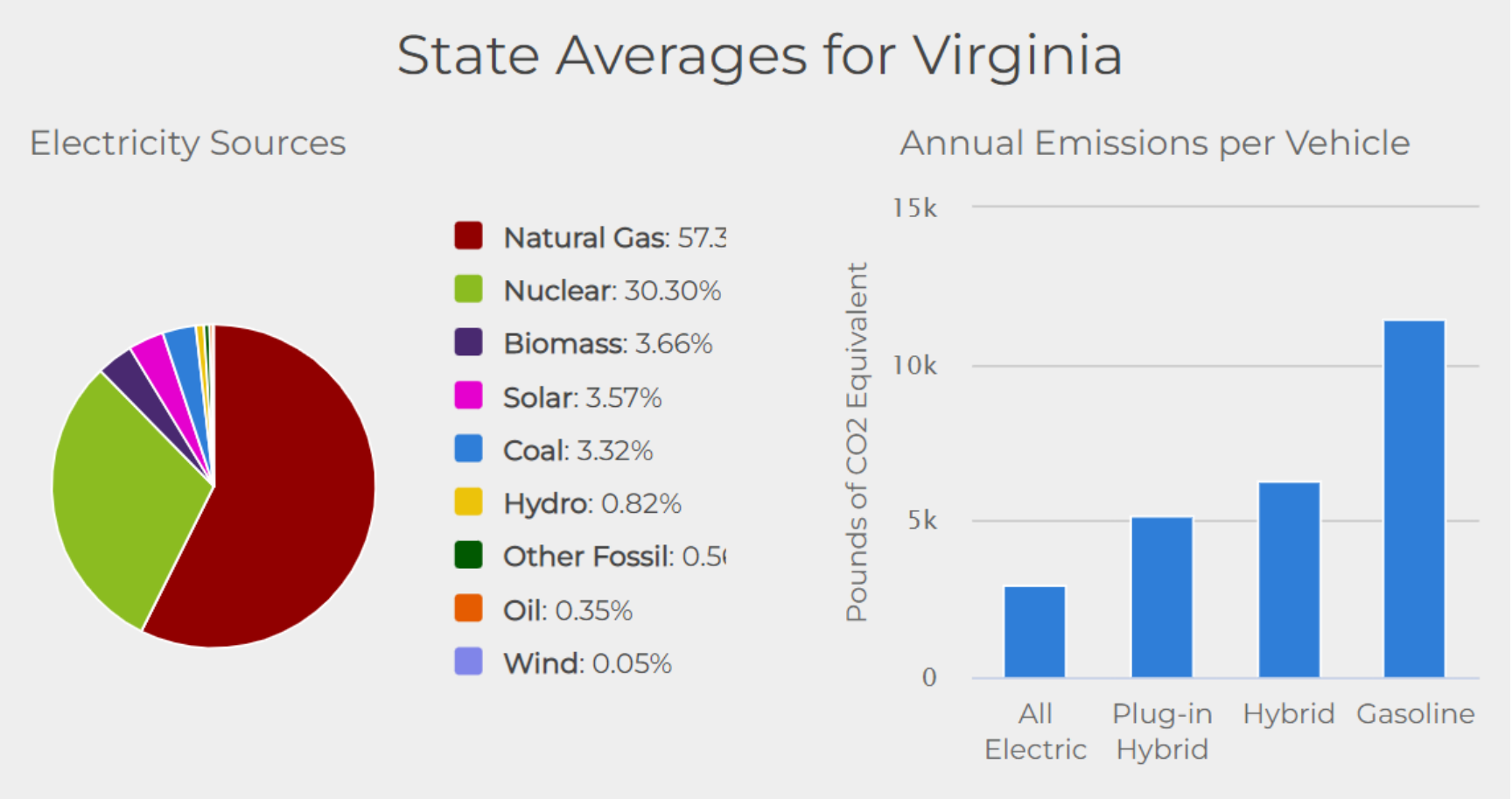
Questions & Discussion

Backup Slides

Supplemental Data

Electric Grid Mix for Virginia



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Lifecycle GHG

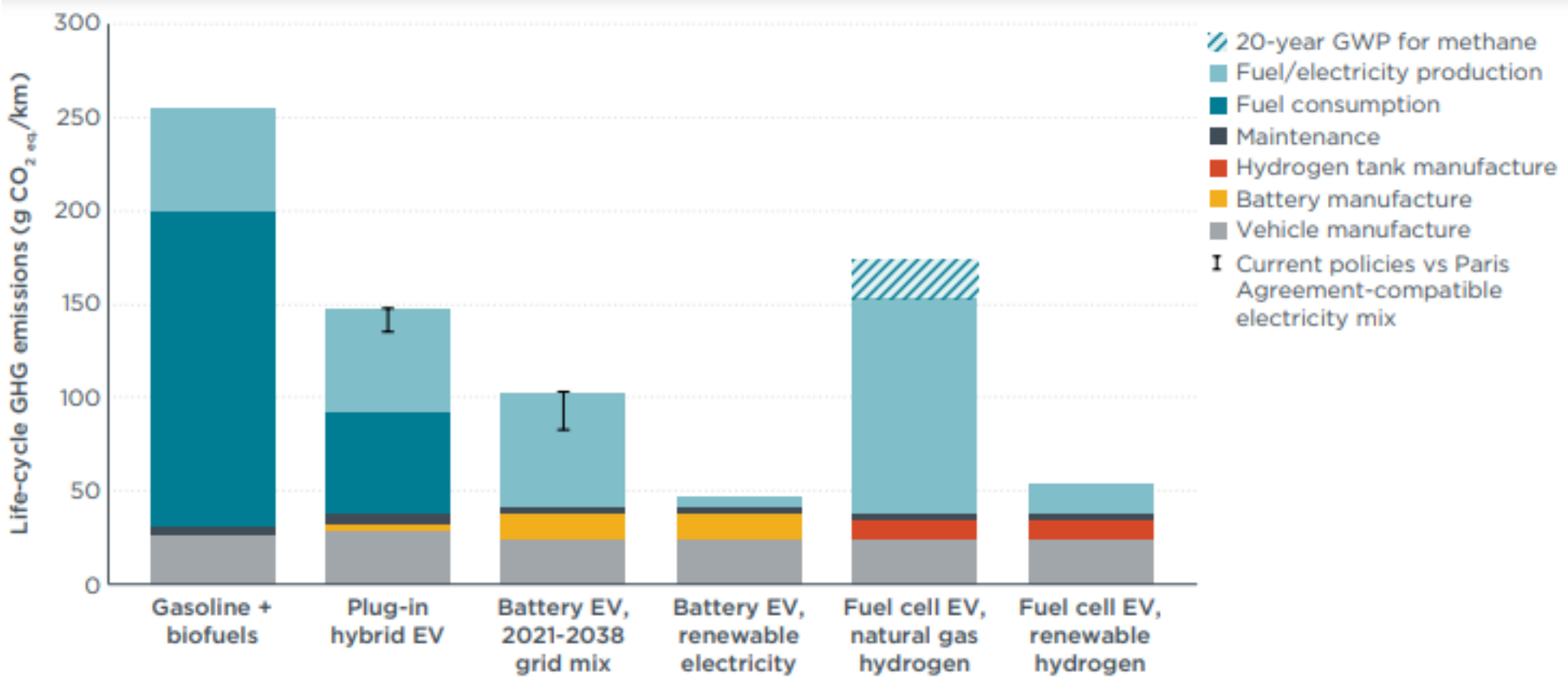

Figure 4.1. Life-cycle GHG emissions of passenger car segment gasoline ICEVs, PHEVs, BEVs, and FCEVs registered in the United States in 2021.

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Lifecycle GHG

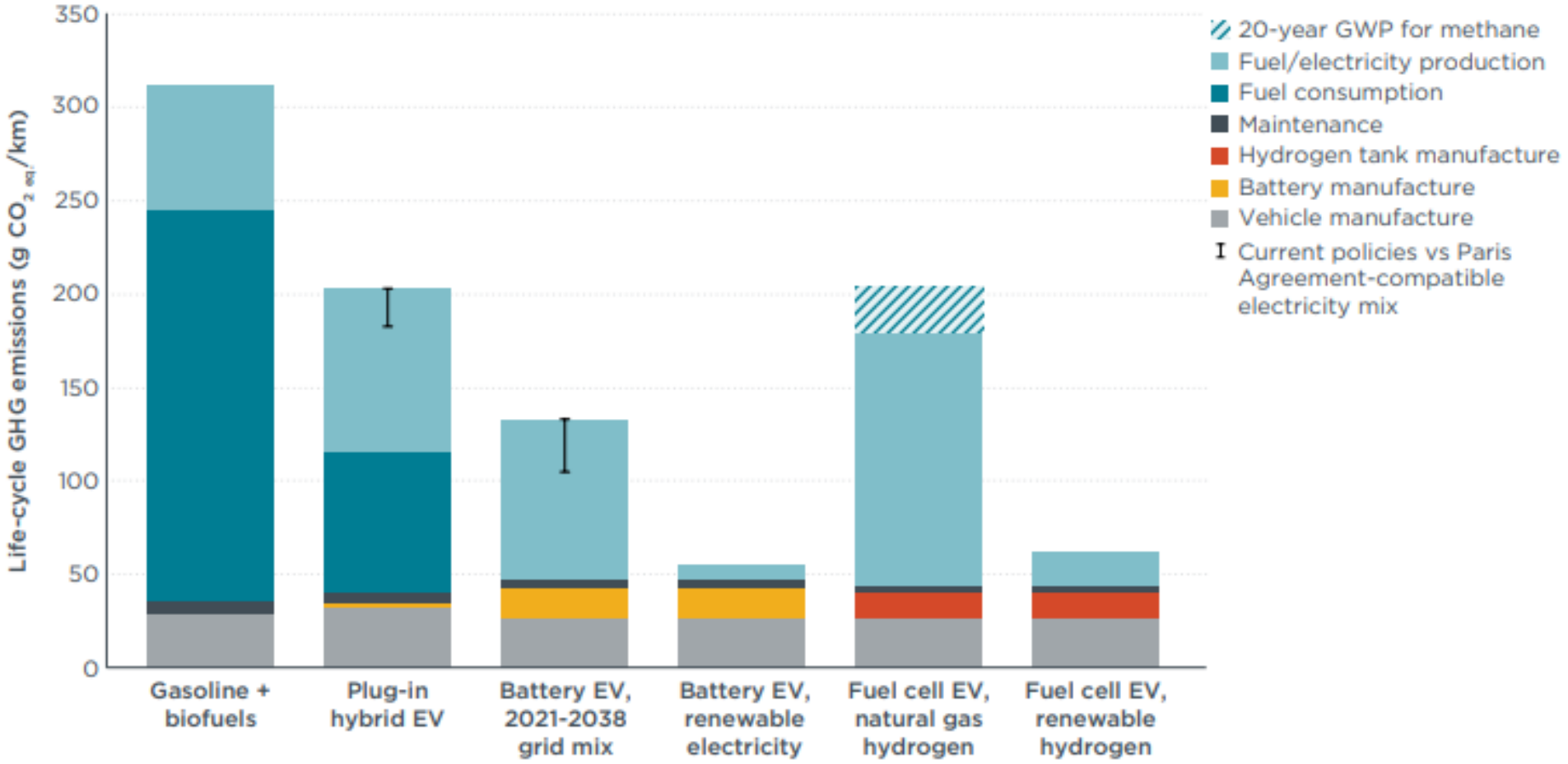

Figure 4.2. Life-cycle GHG emissions of SUV segment gasoline ICEVs, PHEVs, BEVs, and FCEVs registered in the United States in 2021.

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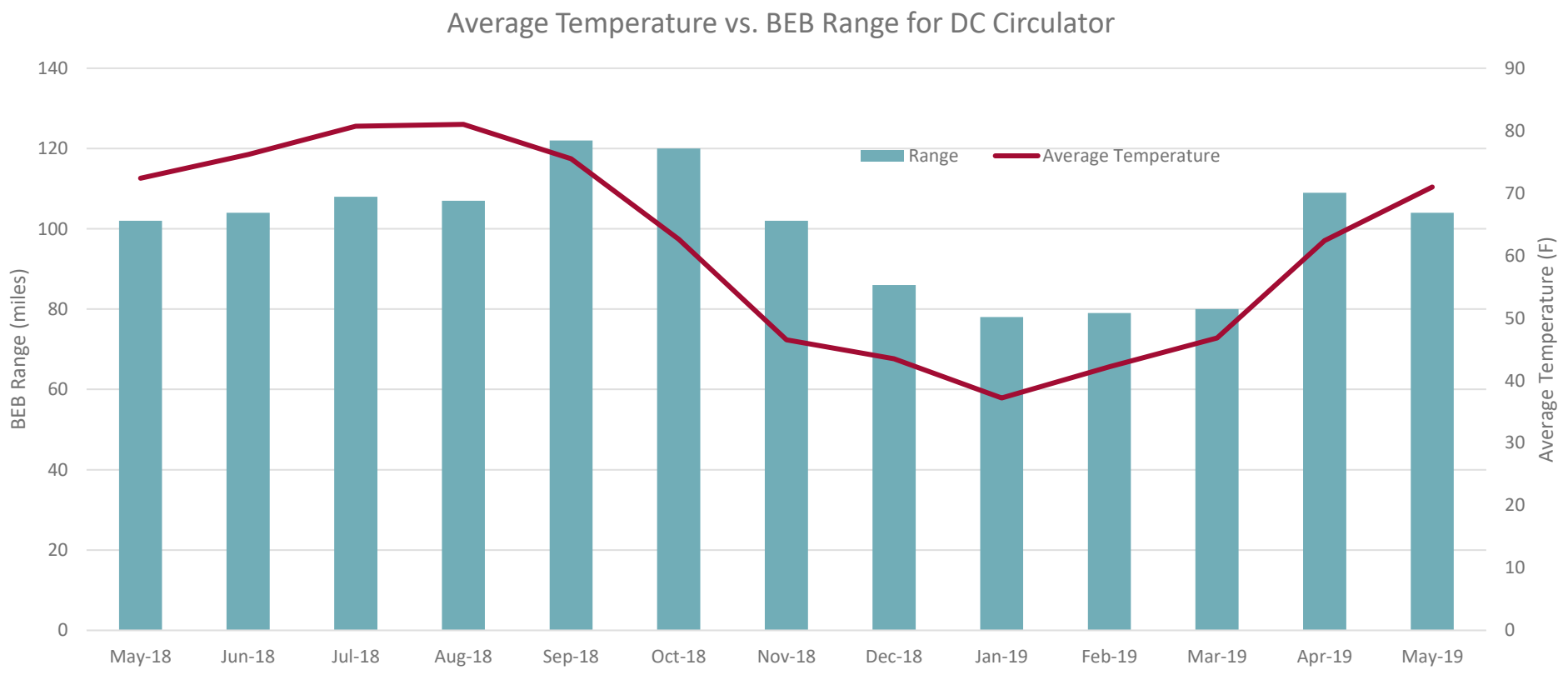
Vehicle Range vs. Temperature (DDOT)



DDOT Pilot Study Average Operating Range (By Month) Vs. Average Washington, DC, Temperatures
(District Department of Transportation, 2021)
(National Centers for Environmental Information (NCEI), 2021)

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