EV Power - Lab 4 Project Report

Part 0: libraries

```
library(readr)
library(tidyr)
library(dplyr)
```

```

Attaching package: 'dplyr'
```

```
The following objects are masked from 'package:stats':

    filter, lag
```

```
The following objects are masked from 'package:base':

    intersect, setdiff, setequal, union
```

```
library(stringr)
library(usdata)
library(ggplot2)
```

Part 1: Defining Research Question

Chosen Question: Are rate of EV registration associated with a demonstrated growth in renewable investment?

Part 2: Data Preparation and Cleaning

```
renewable_use_23 <- read.csv("renew-use-2023.csv")
wider23 <- renewable_use_23 |>
   pivot_wider(names_from = "Energy_Source", values_from =
"Renewable_Use_2023") |>
   mutate(across(
    -State,
    ~ .x |>
      str_replace_all("[^0-9\\.]", "") %>%
      as.numeric()
  ))
```

```
renewable_use_22 <- read.csv("renew-use-2022.csv")
wider22 <- renewable_use_22 |>
   pivot_wider(names_from = "Energy_Source", values_from =
"Renewable_Use_2022") |>
   mutate(across(
    -State,
    ~ .x |>
      str_replace_all("[^0-9\\.]", "") %>%
      as.numeric()
  ))

state_ev_data <- read_csv("ev-registrations-by-state-2023.csv")
```

```
New names:
Rows: 54 Columns: 2
── Column specification
──────────────────────────────────────────────────────── Delimiter: "," chr
(2): electric vehicle registrations_by_state (2023), ...2
ℹ Use `spec()` to retrieve the full column specification for this data. ℹ
Specify the column types or set `show_col_types = FALSE` to quiet this
message.
• `` -> `...2`
```

```
colnames(state_ev_data)[1] <- "State"
colnames(state_ev_data)[2] <- "Registrations"
state_ev <- state_ev_data |>
    slice(-1, -2) |>
    mutate(State = state2abbr(State)) |>
    mutate(across(
        -State,
        ~ .x |>
            str_replace_all("[^0-9\\.]", "") %>%
      as.numeric()
    ))
```

Part 3: Joining / Pivoting Datasets for Analysis

```
wider22 <- wider22 |>
    mutate(Spend = rowSums(across(where(is.numeric)), na.rm = TRUE)) |>
    select(State, Spend)

wider23 <- wider23 |>
    mutate(Spend = rowSums(across(where(is.numeric)), na.rm = TRUE)) |>
    select(State, Spend) |>
```

```
    mutate(State = str_to_upper(State))

joined_spend <- wider22 |>
  inner_join(wider23, join_by(State), suffix = c("_1", "_2")) |>
  mutate(Increase = if_else(Spend_2 > Spend_1, 1, 0))
```

Part 4: Mapping Visualization

```
spend22 <- wider22 |>
    ggplot(aes(x = State, y = Spend)) +
    geom_col()

spend23 <- wider23 |>
    ggplot(aes(x = State, y = Spend)) +
    geom_col()
```