

# EV Power - Renewable Energy by State

## Example Solution 1

### Part 0: libraries

```
library(tidyverse)
```

```
— Attaching core tidyverse packages ————— tidyverse 2.0.0
—
✓ dplyr      1.1.4      ✓ readr      2.1.5
✓ forcats    1.0.1      ✓ stringr    1.5.2
✓ ggplot2    3.5.2      ✓ tibble     3.2.1
✓ lubridate  1.9.4      ✓ tidyr      1.3.1
✓ purrr      1.1.0
— Conflicts ————— tidyverse_conflicts()
—
* dplyr::filter() masks stats::filter()
* dplyr::lag()     masks stats::lag()
i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all
  conflicts to become errors
```

### Part 1: Overview

Chosen Question: I wanted to understand the breakdown of renewable energy by state to see how it compares across the US. I decided to use the US total energy use dataset and create a map with states as the x-axis and renewable energy use as the y-axis, after filtering for just renewable energy.

### Part 2: Description of Data and Methods

I used pivot long to organize the data into a data frame with the columns being energy source, energy use, and states (see below for data and methods where I actually perform the pivot long).#

### Part 3: Data and Methods

```
library(tidyverse)

df <- read.csv("/Users/karuna/stat133/project_4/ev-power-karunaevach/data/
total-use-2023.csv")

df_long <- df %>%
  pivot_longer(
    cols = -Energy_Source,
```

```

    names_to = "State",
    values_to = "Energy_Use"
  )
df_long

```

```

# A tibble: 260 × 3
  Energy_Source State Energy_Use
  <chr>         <chr>      <int>
1 coal_usage   AK         18414
2 coal_usage   AL         224926
3 coal_usage   AR         180262
4 coal_usage   AZ         137885
5 coal_usage   CA          28746
6 coal_usage   CO        204826
7 coal_usage   CT           0
8 coal_usage   DC           0
9 coal_usage   DE          338
10 coal_usage  FL        129387
# i 250 more rows

```

## Part 4: Mapping Visualization

```

df_long |> filter(Energy_Source == "total renewable-energy") |>
  arrange(Energy_Use) |>
  ggplot(aes(y = Energy_Use,
             x = State,
             group = State, color = State)) +
  geom_point() +
  geom_path() + scale_y_log10() + scale_y_discrete(expand = expansion(mult =
c(1, 1))) +
  labs(title = "Renewable vs. Coal by state")

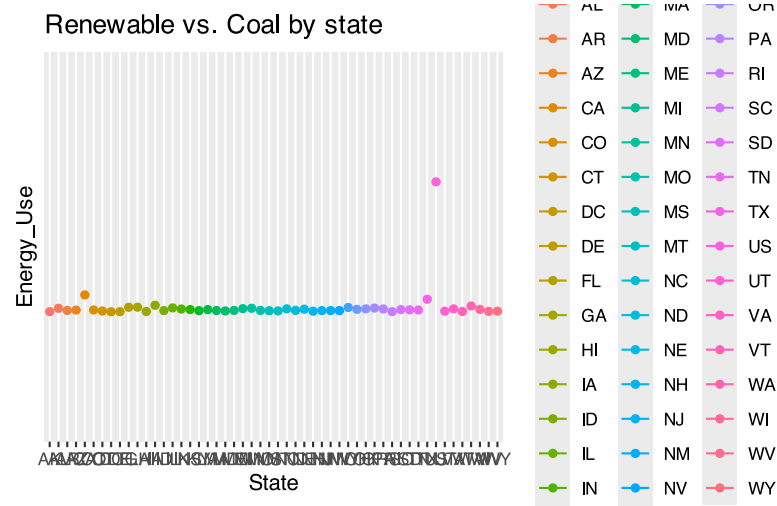
```

Scale for y is already present.

Adding another scale for y, which will replace the existing scale.

`geom\_path()`: Each group consists of only one observation.

i Do you need to adjust the group aesthetic?



## Part 5: Analysis

I thought it was super interesting how most states seemed to have a relatively similar energy use. I would have expected the numbers to greatly differ, but they seemed quite consistent across the board.