

# EV Power - Lab 4 Project Report

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## Example Solution 1

### Part 0: libraries

### Part 1: Defining Research Question

Chosen Question: How is the EV sells effect the price of electricity and usage of electricity.

### Part 2: Data Preparation and Cleaning

```
# Cleaning renew dataset column 2

cleaned_renew_1[[3]] = as.integer(str_match(renew_1[,3], pattern= "[0-9]+"))
cleaned_renew_2[[3]] = as.integer(str_match(renew_2[,3], pattern= "[0-9]+"))
cleaned_renew_3[[3]] = as.integer(str_match(renew_3[,3], pattern= "[0-9]+"))

cleaned_ev_registration[[2]] = as.integer(str_match(ev_registration[c(-1,-2)],
[,2], pattern= "[0-9]+"))
cleaned_ev_registration = cleaned_ev_registration[-
nrow(cleaned_ev_registration), ]
cleaned_ev_registration = left_join(x = s, y = cleaned_ev_registration, by=
join_by(Name == electric.vehicle.registrations_by_state..2023.))

cleaned_total_1 = pivot_longer(total_energy_use_1, cols=
colnames(total_energy_use_1)[-1], names_to= "States", values_to= "use2021" )
cleaned_total_2 = pivot_longer(total_energy_use_2, cols=
colnames(total_energy_use_2)[-1], names_to= "States", values_to= "use2022" )
cleaned_total_3 = pivot_longer(total_energy_use_3, cols=
colnames(total_energy_use_3)[-1], names_to= "States", values_to= "use2023" )
```

### Part 3: Joining / Pivoting Datasets for Analysis

```
join_total_by_states = cleaned_total_1 |> group_by(States) |> slice_head(n =
1) |> filter(States != "US")
join_total_by_states = join_total_by_states[,2]
join_total_by_states = left_join(x= join_total_by_states, y=
cleaned_ev_registration[, -2], by= join_by(States == Abbreviation))
# join_total_by_states = left_join(x= join_total_by_states, y=
cleaned_total_1)
# join_total_by_states = left_join(x= join_total_by_states, y=
```

```
cleaned_total_2)
join_total_by_states = left_join(x= join_total_by_states, y= cleaned_total_3)
```

Joining with `by = join\_by(States)`

```
colnames(join_total_by_states) = c("States", "EV_Sale", "Supplier",
"Electric_Uses")
```

## Part 4: Mapping Visualization

```
join_total_by_states |> ggplot(aes(x= States)) + geom_col(aes(y=
Electric_Uses, fill= Supplier)) + geom_point(aes(y= EV_Sale * 20))
```

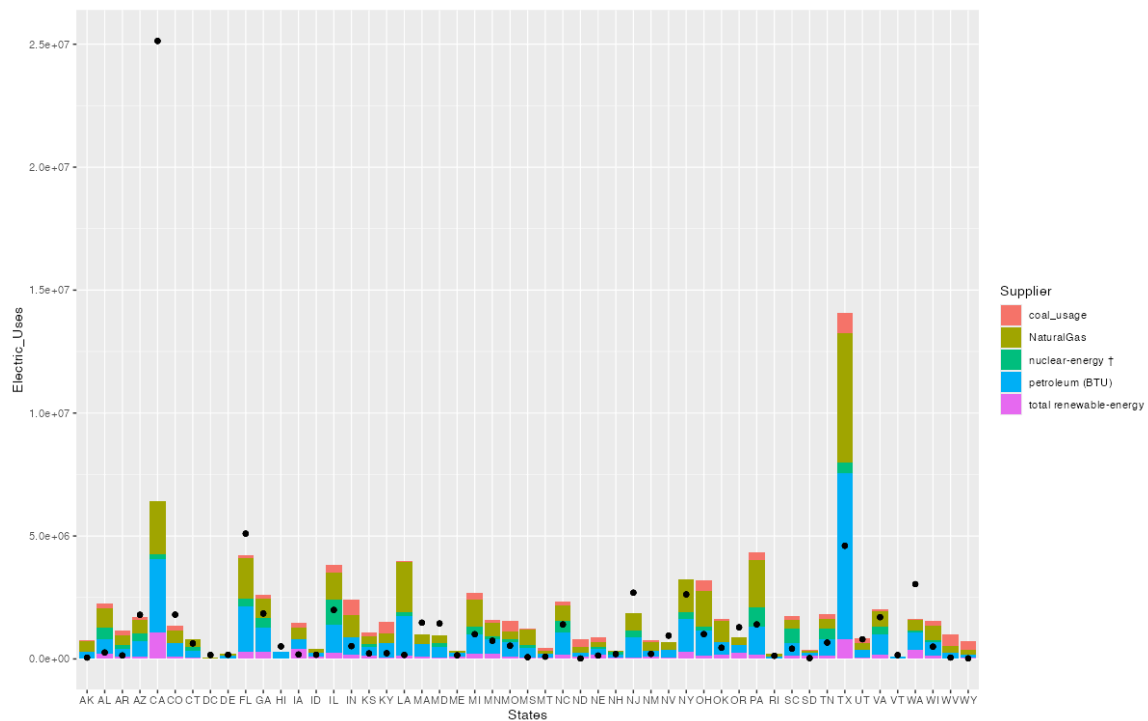


Figure 1: plot

From the graph we can see that the black dot is the sale of EVs (Which is linear rescaled for visualization purpose, which y-axis is not correspond to real EV sale), there are same proportions. which compare to other states, high EV Sale will almost have higher electric use