03-2

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```
# Load packages ------------------------------------------------------------

library(tidyverse)
library(sf)

# Load the data ------------------------------------------------------------

electricity_station_initial <-

  # read in the dataset

  st_read('data_own/alt_fuel_stations.geojson') %>%

  # convert an sf object into a pure tibble

  as_tibble()
```

```
## Reading layer `alt_fuel_stations' from data source
##   `/Users/maxzhang/GU/Data_viz/data_own/alt_fuel_stations.geojson'
##   using driver `GeoJSON'
## Simple feature collection with 58698 features and 66 fields
## Geometry type: POINT
## Dimension:     XY
## Bounding box:  xmin: -164.8489 ymin: 0 xmax: 77.64996 ymax: 64.85247
## Geodetic CRS:  WGS 84
```

```
electricity_station <-
  electricity_station_initial %>%

  # filter for the wanted types

  filter(

    # only include public electricity stations but not private ones

    access_code == 'public',

    # only include those are currently available but not planned nor
    # temporarily unavailable

    status_code == 'E',

    # only include those in the US

    country == 'US',

    # only include the charging stations open to the public

    restricted_access == FALSE) %>%

  # select the wanted traits of those electricity charging stations

  select(
    c(access_days_time, id, open_date, owner_type_code, state,
      ev_pricing, ev_renewable_source, facility_type))

# Data preparation ------------------------------------------------------

p2 <-
  elec_date <-
  electricity_station %>%
  filter(!is.na(open_date),
         !is.na(owner_type_code)) %>%
  mutate(open_time =
           if_else(open_date >= lubridate::ymd('2021-11-16'),
                   'Newly constructed',
                   'Pre-existing')) %>%
  mutate(owner_type_new =
           case_when(
             owner_type_code == 'FG' ~ 'Federal',
             owner_type_code == 'J' ~ 'Jointly',
             owner_type_code == 'LG' ~ 'Local/Municipal',
             owner_type_code == 'P' ~ 'Privately',
             owner_type_code == 'SG' ~ 'State/Provincial',
             owner_type_code == 'T' ~ 'Utility'))

elec_date$owner_type_new <-
  factor(elec_date$owner_type_new,
```

```
         levels = c('Federal',
                    'State/Provincial',
                    'Local/Municipal',
                    'Jointly',
                    'Utility',
                    'Privately'))

# Data visualization-------------------------------------------------------

p2 <-
  elec_date %>%
  ggplot(mapping =
           aes(x = owner_type_new)) +
  geom_bar(aes(fill = open_time),
           position = 'dodge') +
  scale_x_discrete(drop = FALSE) +

  # to use green to represent free while use a diverging color of orange to
  # represent not free

  scale_fill_manual(values = c('#5ab4ac',
                               '#d8b365')) +
  labs(title = paste('Bipartisan Infrastructure Law Incentives for building EV',
                     'charging posts'),
       subtitle = paste('Comparison of the number of charging piles built by',
                        'different entities before and after November 16, 2021'),
       caption = 'Data: afdc.energy.gov',
       x = 'Ownership of EV charging posts',
       y = 'Count (numbers)') +
  theme(
    axis.ticks = element_blank(),
    panel.background = element_blank())
```