

Energy Consumption Analysis

```
# Using the following libraries  
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 4.2.3
```

```
## Warning: package 'ggplot2' was built under R version 4.2.3
```

```
## Warning: package 'tibble' was built under R version 4.2.3
```

```
## Warning: package 'tidyr' was built under R version 4.2.3
```

```
## Warning: package 'readr' was built under R version 4.2.3
```

```
## Warning: package 'purrr' was built under R version 4.2.3
```

```
## Warning: package 'dplyr' was built under R version 4.2.3
```

```
## Warning: package 'stringr' was built under R version 4.2.3
```

```
## Warning: package 'forcats' was built under R version 4.2.3
```

```
## Warning: package 'lubridate' was built under R version 4.2.3
```

```
## — Attaching core tidyverse packages ————— tidyverse 2.0.0 —  
## ✓ dplyr     1.1.3    ✓ readr     2.1.4  
## ✓forcats   1.0.0    ✓ stringr   1.5.0  
## ✓ ggplot2   3.4.4    ✓ tibble    3.2.1  
## ✓ lubridate 1.9.3    ✓ tidyr    1.3.0  
## ✓ purrr    1.0.2  
## — 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 be  
come errors
```

```
library(arrow)
```

```
##  
## Attaching package: 'arrow'  
##  
## The following object is masked from 'package:lubridate':  
##  
##     duration  
##  
## The following object is masked from 'package:utils':  
##  
##     timestamp
```

```
library(dplyr)  
library(data.table)
```

```
## Warning: package 'data.table' was built under R version 4.2.3
```

```
##  
## Attaching package: 'data.table'  
##  
## The following objects are masked from 'package:lubridate':  
##  
##     hour, isoweek, mday, minute, month, quarter, second, wday, week,  
##     yday, year  
##  
## The following objects are masked from 'package:dplyr':  
##  
##     between, first, last  
##  
## The following object is masked from 'package:purrr':  
##  
##     transpose
```

```
library(lubridate)  
library(caret)
```

```
## Warning: package 'caret' was built under R version 4.2.3
```

```
## Loading required package: lattice  
##  
## Attaching package: 'caret'  
##  
## The following object is masked from 'package:purrr':  
##  
##     lift
```

Data Exploration and Cleaning

```

static_house_info_url <- "https://intro-datasience.s3.us-east-2.amazonaws.com/SC-data/static_
_house_info.parquet"
Meta_data_url <- "https://intro-datasience.s3.us-east-2.amazonaws.com/SC-data/data_dictionary.csv"

# Reading static_house_data_set, and metadataset
static_house_info_df <- read_parquet(static_house_info_url)
Meta_data_df <- read_csv_arrow(Meta_data_url)

#Obtaining Unique building ids and counties.
bldg_id <- unique(static_house_info_df$bldg_id)
counties <- unique(static_house_info_df$in.county)

```

```

# Function to obtain energy related data using building id
obtain_energy <- function(bldg_id) {

  url <- glue::glue("https://intro-datasience.s3.us-east-2.amazonaws.com/SC-data/2023-houseData/", bldg_id, ".parquet")

  df <- arrow::read_parquet(url)

  #Choosing the data of energy consumption in month of July
  df <- df %>% filter(month(time) == 7)

  # Checking the numeric variables for negative values and converting them to positive values
  numerical_cols <- sapply(df, is.numeric)
  df[, numerical_cols] <- lapply(df[, numerical_cols], function(x) ifelse(x < 0, abs(x), x))

  # Obtaining total energy consumption for hour
  df$total_energy_hour <- rowSums(df[,-which(names(df) == 'time')])

  df <- df[, c('time', 'total_energy')]

  df$time <- as.POSIXct(df$time, tz= 'EST', origin = '1970-01-01')

  # Aggregating by day, obtaining daily total energy consumption for month of july
  daily_df <- df %>%
    mutate(date = as.Date(time)) %>%
    mutate(bldg_id = bldg_id) %>%
    group_by(bldg_id, date) %>%
    summarize(total_energy = sum(total_energy_hour, na.rm = TRUE), .groups = 'drop')
}

return(daily_df)
}

# Calling obtain_energy function for all building ids
total_energy_df <- purrr::map_dfr(bldg_id, obtain_energy)

#write_csv(total_energy_df, "C:/Users/Ramya/IDS/Final Project/total_energy.csv")

```

```
# Merging total energy dataset with static house info dataset on building id.
merge_df <- merge(static_house_info_df, total_energy_df, by = "bldg_id")
```

```
# Function to obtain weather related details for counties.
obtain_weather_data <- function(county) {

  url <- glue::glue(paste0("https://intro-datasience.s3.us-east-2.amazonaws.com/SC-data/weather/2023-weather-data/", county, ".csv"))
  df <- read.csv(url)
  df$date_time <- as.Date(df$date_time, format = "%Y-%m-%d %H:%M:%S")

  # Obtaining median of weather details for every day of Month July
  daily_data <- df %>%
    group_by(date_time = as.Date(date_time, tz='GMT')) %>%
    summarise_all(mean) %>%
    filter(month(date_time) == 7) %>%
    mutate(county_id = county) %>%
    group_by(county_id, date_time) %>%
    summarise(Direct_Normal_Radiation = median(Direct.Normal.Radiation..W.m2., na.rm = TRUE),
              Diffuse_Horizontal_Radiation = median(Diffuse.Horizontal.Radiation..W.m2., na.rm = TRUE),
              Dry_Bulb_Temperature = median(Dry.Bulb.Temperature...C., na.rm = TRUE),
              Relative_Humidity = median(Relative.Humidity...., na.rm = TRUE),
              Wind_Speed = median(Wind.Speed..m.s., na.rm = TRUE),
              Wind_Direction = median(Wind.Direction..Deg., na.rm = TRUE),
              Global_Horizontal_Radiation = median(Global.Horizontal.Radiation..W.m2., na.rm = TRUE), .groups = 'drop') %>%
    mutate(date = date_time) %>%
    mutate(in.county = county_id)

  return(daily_data)
}

#Calling obtain_weather_data function for all counties
weather_df <- purrr::map_dfr(counties, obtain_weather_data)
```

```
# Merging all the datasets based on county and date
final_merged_df <- merge(merge_df, weather_df, by = c("in.county", "date"))

#Storing the final merged data into final_merged_df.csv
write.csv(final_merged_df, 'C:/Ramya/Syracuse/IDS/Final Project/pro/final_merged_df.csv')
```

```
# Reading data from final_merged_df.csv file
final_merged_df <- read.csv('C:/Ramya/Syracuse/IDS/Final Project/pro/final_merged_df.csv')

# Removing the index column after reading from .csv file
final_merged_df <- final_merged_df %>% select(-X)

# Looking for null values in all columns
null_values <- colSums(is.na(final_merged_df))

# Printing the result
print(null_values)
```

```
##          in.county
##          0
##          date
##          0
##          bldg_id
##          0
##          upgrade
##          0
##          weight
##          0
##          applicability
##          0
##          in.sqft
##          0
##          in.ahs_region
##          0
##          in.ashrae_iecc_climate_zone_2004
##          0
##          in.ashrae_iecc_climate_zone_2004_2_a_split
##          0
##          in.bathroom_spot_vent_hour
##          0
##          in.bedrooms
##          0
##          in.building_america_climate_zone
##          0
##          in.cec_climate_zone
##          0
##          in.ceiling_fan
##          0
##          in.census_division
##          0
##          in.census_division_recs
##          0
##          in.census_region
##          0
##          in.city
##          0
##          in.clothes_dryer
##          0
##          in.clothes_washer
##          0
##          in.clothes_washer_presence
##          0
##          in.cooking_range
##          0
##          in.cooling_setpoint
##          0
##          in.cooling_setpoint_has_offset
##          0
##          in.cooling_setpoint_offset_magnitude
##          0
##          in.cooling_setpoint_offset_period
##          0
##          in.corridor
```

```
##          0
##      in.county_and_puma
##          0
##      in.dehumidifier
##          0
##      in.dishwasher
##          0
##      in.door_area
##          0
##      in.doors
##          0
##      in.ducts
##          0
##      in.eaves
##          0
##      in.electric_vehicle
##          0
##      in.emissions_electricity_folders
##          0
##      in.emissions_electricity_units
##          0
##      in.emissions_electricity_values_or_filepaths
##          0
##      in.emissions_fossil_fuel_units
##          0
##      in.emissions_fuel_oil_values
##          0
##      in.emissions_natural_gas_values
##          0
##      in.emissions_propane_values
##          0
##      in.emissions_scenario_names
##          0
##      in.emissions_types
##          0
##      in.emissions_wood_values
##          0
##      in.federal_poverty_level
##          0
##      in.generation_and_emissions_assessment_region
##          0
##      in.geometry_attic_type
##          0
##      in.geometry_building_horizontal_location_mf
##          0
##      in.geometry_building_horizontal_location_sfa
##          0
##      in.geometry_building_level_mf
##          0
##      in.geometry_building_number_units_mf
##          0
##      in.geometry_building_number_units_sfa
##          0
##      in.geometry_building_type_acs
##          0
##      in.geometry_building_type_height
```

```
##                                     0
##      in.geometry_building_type_rec 0
##      in.geometry_floor_area        0
##      in.geometry_floor_area_bin   0
##      in.geometry.foundation_type   0
##      in.geometry_garage           0
##      in.geometry_stories          0
##      in.geometry_stories_low_rise 0
##      in.geometry_story_bin        0
##      in.geometry_wall_exterior_finish 0
##      in.geometry_wall_type        0
##      in.has_pv                     0
##      in.heating_fuel               0
##      in.heating_setpoint            0
##      in.heating_setpoint_has_offset 0
##      in.heating_setpoint_offset_magnitude 0
##      in.heating_setpoint_offset_period 0
##      in.holiday_lighting           0
##      in.hot_water_distribution     0
##      in.hot_water_fixtures         0
##      in.hvac_cooling_efficiency    0
##      in.hvac_cooling_partial_space_conditioning 0
##      in.hvac_cooling_type          0
##      in.hvac_has_ducts             0
##      in.hvac_has_shared_system     0
##      in.hvac_has_zonal_electric_heating 0
##      in.hvac_heating_efficiency    0
##      in.hvac_heating_type          0
##      in.hvac_heating_type_and_fuel
```

```
##                                     0
##      in.hvac_secondary_heating_efficiency
##                                     0
##      in.hvac_secondary_heating_type_and_fuel
##                                     0
##      in.hvac_shared_efficiencies
##                                     0
##      in.hvac_system_is_faulted
##                                     0
##      in.hvac_system_single_speed_ac_airflow
##                                     0
##      in.hvac_system_single_speed_ac_charge
##                                     0
##      in.hvac_system_single_speed_ashp_airflow
##                                     0
##      in.hvac_system_single_speed_ashp_charge
##                                     0
##      in.income
##                                     0
##      in.income_recs_2015
##                                     0
##      in.income_recs_2020
##                                     0
##      in.infiltration
##                                     0
##      in.insulation_ceiling
##                                     0
##      in.insulation_floor
##                                     0
##      in.insulation.foundation_wall
##                                     0
##      in.insulation_rim_joist
##                                     0
##      in.insulation_roof
##                                     0
##      in.insulation_slab
##                                     0
##      in.insulation_wall
##                                     0
##      in.interior_shading
##                                     0
##      in.iso_rto_region
##                                     0
##      in.lighting
##                                     0
##      in.lighting_interior_use
##                                     0
##      in.lighting_other_use
##                                     0
##      in.location_region
##                                     0
##      in.mechanical_ventilation
##                                     0
##      in.misc_extra_refrigerator
##                                     0
##      in.misc_freezer
```

```
##          0
##      in.misc_gas_fireplace
##          0
##      in.misc_gas_grill
##          0
##      in.misc_gas_lighting
##          0
##      in.misc_hot_tub_spa
##          0
##      in.misc_pool
##          0
##      in.misc_pool_heater
##          0
##      in.misc_pool_pump
##          0
##      in.misc_well_pump
##          0
##      in.natural_ventilation
##          0
##      in.neighbors
##          0
##      in.occupants
##          0
##      in.orientation
##          0
##      in.overhangs
##          0
##      in.plug_load_diversity
##          0
##      in.plug_loads
##          0
##      in.puma
##          0
##      in.puma_metro_status
##          0
##      in.pv_orientation
##          0
##      in.pv_system_size
##          0
##      in.radiant_barrier
##          0
##      in.range_spot_vent_hour
##          0
##      in.reeds_balancing_area
##          0
##      in.refrigerator
##          0
##      in.roof_material
##          0
##      in.schedules
##          0
##      in.simulation_control_run_period_begin_day_of_month
##          0
##      in.simulation_control_run_period_begin_month
##          0
##      in.simulation_control_run_period_calendar_year
```

```
##          0
##  in.simulation_control_run_period_end_day_of_month      0
##          in.simulation_control_run_period_end_month      0
##          in.simulation_control_timestep      0
##          in.solar_hot_water      0
##          in.state      0
##          in.tenure      0
##          in.units_represented      0
##          in.usage_level      0
##          in.vacancy_status      0
##          in.vintage      0
##          in.vintage_acs      0
##          in.water_heater_efficiency      0
##          in.water_heater_fuel      0
##          in.water_heater_in_unit      0
##          in.weather_file_city      0
##          in.weather_file_latitude      0
##          in.weather_file_longitude      0
##          in.window_areas      0
##          in.windows      0
##          upgrade.insulation_roof      0
##          upgrade.water_heater_efficiency      0
##          upgrade.hvac_cooling_efficiency      0
##          upgrade.infiltration_reduction      0
##          upgrade.geometry.foundation_type      0
##          upgrade.clothes_dryer      0
##          upgrade.insulation_ceiling      0
##          upgrade.ducts      0
##          upgrade.hvac_heating_type
```

```

##                                     0
##           upgrade.insulation_wall
##                                     0
##           upgrade.insulation.foundation_wall
##                                     0
##           upgrade.hvac_heating_efficiency
##                                     0
##           upgrade.cooking_range
##                                     0
##           total_energy
##                                     0
##           county_id
##                                     0
##           date_time
##                                     0
##           Direct_Normal_Radiation
##                                     0
##           Diffuse_Horizontal_Radiation
##                                     0
##           Dry_Bulb_Temperature
##                                     0
##           Relative_Humidity
##                                     0
##           Wind_Speed
##                                     0
##           Wind_Direction
##                                     0
##           Global_Horizontal_Radiation
##                                     0
##
```

```

# Function to check the frequency of values in column
freq_table <- function(column){
  freq_df <- data.frame(
    col_name = column,
    frequency = nrow(data.frame(table(final_merged_df[,column])))
  )
  return (freq_df)
}

freq_df <- purrr::map_dfr(colnames(final_merged_df), freq_table)

# Obtaining columns whose frequency is greater than 1
col_names <- freq_df[freq_df$frequency>1, ]$col_name

# Obtaining final merged dataset whose columns have more than 1 different values
cleaned_final_df <- final_merged_df[, col_names]

```

```

# Maintaining the data consistency and readability by removing the units from values and converting them into numerical type.

# Removing F from in.cooling_setpoint column
cleaned_final_df$in.cooling_setpoint <- as.numeric(sub("F", "", cleaned_final_df$in.cooling_setpoint))

# Removing F from in.cooling_setpoint_offset_magnitude column
cleaned_final_df$in.cooling_setpoint_offset_magnitude <- as.numeric(sub("F", "", cleaned_final_df$in.cooling_setpoint_offset_magnitude))

# Removing F from in.heating_setpoint column
cleaned_final_df$in.heating_setpoint <- as.numeric(sub("F", "", cleaned_final_df$in.heating_setpoint))

# Removing F from in.heating_setpoint_offset_magnitude column
cleaned_final_df$in.heating_setpoint_offset_magnitude <- as.numeric(sub("F", "", cleaned_final_df$in.heating_setpoint_offset_magnitude))

# Removing Hour from in.bathroom_spot_vent_hour column
cleaned_final_df$in.bathroom_spot_vent_hour <- as.numeric(sub("Hour", "", cleaned_final_df$in.bathroom_spot_vent_hour))

# Removing Hour from in.range_spot_vent_hour column
cleaned_final_df$in.range_spot_vent_hour <- as.numeric(sub("Hour", "", cleaned_final_df$in.range_spot_vent_hour))

# Removing ACH50 from in.infiltration column
cleaned_final_df$in.infiltration <- as.numeric(sub(" ACH50", "", cleaned_final_df$in.infiltration))

# Removing None, Car from in.geometry_garage column
cleaned_final_df$in.geometry_garage <- ifelse(cleaned_final_df$in.geometry_garage == "None", 0, as.numeric(gsub(" Car", "", cleaned_final_df$in.geometry_garage)))

## Warning in ifelse(cleaned_final_df$in.geometry_garage == "None", 0,
## as.numeric(gsub(" Car", : NAs introduced by coercion

```

```
# For the columns that have ranges, we are generally taking mean for them.
obtain_mean <- function(values) {
  if (grepl(">", values)) {
    greater_than_value <- as.numeric(gsub(">", "", values))
    return(greater_than_value + 1)
  }

  if (grepl("<", values)) {
    less_than_value <- as.numeric(gsub("<", "", values))
    return(less_than_value - 1)
  }

  split <- strsplit(values, "-")[[1]]

  split <- as.numeric(gsub("\\+", "", split))

  if (length(split) == 2) {
    return(mean(split))
  } else {
    return(split[1])
  }
}

cleaned_final_df$in.income <- sapply(cleaned_final_df$in.income, obtain_mean)

cleaned_final_df$in.income_recs_2015 <- sapply(cleaned_final_df$in.income_recs_2015, obtain_mean)

cleaned_final_df$in.income_recs_2020 <- sapply(cleaned_final_df$in.income_recs_2020, obtain_mean)
```

MODEL BUILDING

```
set.seed(123)

# Splitting 80% of data into training set, and 20% into testing set.
trainIndex <- createDataPartition(cleaned_final_df$total_energy , p = 0.8, list = FALSE)

train_data <- cleaned_final_df[trainIndex, ]
test_data <- cleaned_final_df[-trainIndex, ]
```

1. LINEAR REGRESSION

```
#Building Linear regression model to predict total energy
lmout <- lm(total_energy ~ ., data = train_data)

# Display summary
summary(lmout)
```

```

## 
## Call:
## lm(formula = total_energy ~ ., data = train_data)
## 
## Residuals:
##    Min     1Q Median     3Q    Max 
## -38.409 -2.678 -0.379  2.312 56.748 
## 
## Coefficients: (241 not defined because of singularities)
## 
## (Intercept)                               Estimate
## in.countyG4500030                          -8.359e+09
## in.countyG4500050                           1.933e+07
## in.countyG4500070                           1.323e+08
## in.countyG4500090                          -5.595e+07
## in.countyG4500110                           1.323e+08
## in.countyG4500130                           1.323e+08
## in.countyG4500150                           1.465e+08
## in.countyG4500170                           2.157e+08
## in.countyG4500190                           1.323e+08
## in.countyG4500210                           2.340e+07
## in.countyG4500230                           1.119e+08
## in.countyG4500250                           1.567e+08
## in.countyG4500270                           1.709e+08
## in.countyG4500290                           1.465e+08
## in.countyG4500310                           2.472e+08
## in.countyG4500330                           2.838e+08
## in.countyG4500350                           2.157e+08
## in.countyG4500370                           1.221e+07
## in.countyG4500390                           1.180e+08
## in.countyG4500410                           2.472e+08
## in.countyG4500430                           3.296e+08
## in.countyG4500450                          -6.104e+06
## in.countyG4500470                           7.025e-01
## in.countyG4500490                           1.465e+08
## in.countyG4500510                           3.296e+08
## in.countyG4500530                           1.465e+08
## in.countyG4500550                           1.709e+08
## in.countyG4500570                           1.567e+08
## in.countyG4500590                           5.079e-01
## in.countyG4500610                           1.709e+08
## in.countyG4500630                           1.058e+08
## in.countyG4500650                           4.956e-01
## in.countyG4500670                           2.472e+08
## in.countyG4500690                           2.838e+08
## in.countyG4500710                           1.058e+08
## in.countyG4500730                           -7.427e+07
## in.countyG4500750                           1.323e+08
## in.countyG4500770                           -7.427e+07
## in.countyG4500790                           1.180e+08
## in.countyG4500810                           -5.627e-01
## in.countyG4500830                           -6.104e+06
## in.countyG4500850                           1.709e+08
## in.countyG4500870                           -6.104e+06
## in.countyG4500890                           2.472e+08

```

## in.countyG4500910	1.119e+08
## date2018-07-02	5.077e+00
## date2018-07-03	5.385e+00
## date2018-07-04	4.635e+00
## date2018-07-05	4.729e+00
## date2018-07-06	5.013e+00
## date2018-07-07	5.028e+00
## date2018-07-08	2.963e+00
## date2018-07-09	3.530e+00
## date2018-07-10	3.648e+00
## date2018-07-11	4.357e+00
## date2018-07-12	5.194e+00
## date2018-07-13	4.267e+00
## date2018-07-14	4.492e+00
## date2018-07-15	4.748e+00
## date2018-07-16	4.409e+00
## date2018-07-17	3.672e+00
## date2018-07-18	4.017e+00
## date2018-07-19	3.935e+00
## date2018-07-20	3.721e+00
## date2018-07-21	3.905e+00
## date2018-07-22	4.879e+00
## date2018-07-23	4.690e+00
## date2018-07-24	3.603e+00
## date2018-07-25	4.387e+00
## date2018-07-26	3.989e+00
## date2018-07-27	4.046e+00
## date2018-07-28	4.932e+00
## date2018-07-29	5.214e+00
## date2018-07-30	3.884e+00
## date2018-07-31	3.715e+00
## bldg_id	-1.116e-07
## in.sqft	1.064e-02
## in.bathroom_spot_vent_hour	1.309e-02
## in.bedrooms	8.601e-02
## in.building_americana_climate_zoneMixed-Humid	NA
## in.ceiling_fanStandard Efficiency	3.009e-01
## in.ceiling_fanStandard Efficiency, No usage	7.672e-01
## in.cityNot in a census Place	1.530e-01
## in.citySC, Charleston	6.715e-01
## in.citySC, Columbia	-4.427e-01
## in.citySC, Florence	1.711e-01
## in.citySC, Goose Creek	-7.104e-01
## in.citySC, Greenville	-5.207e-01
## in.citySC, Hilton Head Island	-5.362e-02
## in.citySC, Mount Pleasant	-6.696e-01
## in.citySC, Myrtle Beach	1.718e-01
## in.citySC, North Charleston	8.519e-01
## in.citySC, North Myrtle Beach	3.491e-01
## in.citySC, Rock Hill	-2.100e-01
## in.citySC, Spartanburg	-2.673e-01
## in.citySC, Summerville	-8.153e-01
## in.citySC, Sumter	2.121e-01
## in.clothes_dryerElectric, 120% Usage	-2.166e-02
## in.clothes_dryerElectric, 80% Usage	1.058e+00
## in.clothes_dryerGas, 100% Usage	-1.440e-01

## in.clothes_dryerGas, 120% Usage	-4.963e-01
## in.clothes_dryerGas, 80% Usage	1.251e+00
## in.clothes_dryerNone	2.226e-02
## in.clothes_dryerPropane, 100% Usage	-7.675e-01
## in.clothes_dryerPropane, 120% Usage	-2.570e-02
## in.clothes_dryerPropane, 80% Usage	1.042e+00
## in.clothes_washerEnergyStar, 120% Usage	7.285e-01
## in.clothes_washerEnergyStar, 80% Usage	-1.251e+00
## in.clothes_washerNone	-3.479e-01
## in.clothes_washerStandard, 100% Usage	6.224e-01
## in.clothes_washerStandard, 120% Usage	1.738e+00
## in.clothes_washerStandard, 80% Usage	-1.186e+00
## in.clothes_washer_presenceYes	NA
## in.cooking_rangeElectric, 120% Usage	-2.093e+00
## in.cooking_rangeElectric, 80% Usage	-2.780e-01
## in.cooking_rangeGas, 100% Usage	3.364e-02
## in.cooking_rangeGas, 120% Usage	-1.585e+00
## in.cooking_rangeGas, 80% Usage	-7.644e-01
## in.cooking_rangeNone	-2.358e+00
## in.cooking_rangePropane, 100% Usage	2.698e-01
## in.cooking_rangePropane, 120% Usage	-6.316e-01
## in.cooking_rangePropane, 80% Usage	-4.512e-01
## in.cooling_setpoint	-7.742e-01
## in.cooling_setpoint_has_offsetYes	-1.226e+00
## in.cooling_setpoint_offset_magnitude	3.003e-01
## in.cooling_setpoint_offset_periodDay and Night Setup -1h	2.475e-01
## in.cooling_setpoint_offset_periodDay and Night Setup -2h	-8.211e-01
## in.cooling_setpoint_offset_periodDay and Night Setup -3h	-1.199e+00
## in.cooling_setpoint_offset_periodDay and Night Setup -4h	-1.096e-01
## in.cooling_setpoint_offset_periodDay and Night Setup -5h	1.316e+00
## in.cooling_setpoint_offset_periodDay and Night Setup +1h	-7.706e-01
## in.cooling_setpoint_offset_periodDay and Night Setup +2h	-1.140e+00
## in.cooling_setpoint_offset_periodDay and Night Setup +3h	2.043e-01
## in.cooling_setpoint_offset_periodDay and Night Setup +4h	-1.751e+00
## in.cooling_setpoint_offset_periodDay and Night Setup +5h	-1.679e+00
## in.cooling_setpoint_offset_periodDay Setup	6.223e-02
## in.cooling_setpoint_offset_periodDay Setup -1h	-8.545e-02
## in.cooling_setpoint_offset_periodDay Setup -2h	-3.488e-01
## in.cooling_setpoint_offset_periodDay Setup -3h	3.174e-01
## in.cooling_setpoint_offset_periodDay Setup -4h	8.785e-01
## in.cooling_setpoint_offset_periodDay Setup -5h	-1.731e-01
## in.cooling_setpoint_offset_periodDay Setup +1h	3.192e-01
## in.cooling_setpoint_offset_periodDay Setup +2h	-7.838e-01
## in.cooling_setpoint_offset_periodDay Setup +3h	-1.143e+00
## in.cooling_setpoint_offset_periodDay Setup +4h	-2.120e-01
## in.cooling_setpoint_offset_periodDay Setup +5h	-1.438e+00
## in.cooling_setpoint_offset_periodDay Setup and Night Setback	2.621e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -1h	1.369e+00
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -2h	3.102e+00
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -3h	3.535e+00
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -4h	3.631e+00
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -5h	4.023e+00
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +1h	4.619e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +2h	2.427e+00
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +3h	-6.055e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +4h	1.151e+00

## in.cooling_setpoint_offset_periodDay Setup and Night Setback +5h	7.298e-01
## in.cooling_setpoint_offset_periodNight Setback	1.102e+00
## in.cooling_setpoint_offset_periodNight Setback -1h	8.545e-01
## in.cooling_setpoint_offset_periodNight Setback -2h	9.297e-01
## in.cooling_setpoint_offset_periodNight Setback -3h	1.913e+00
## in.cooling_setpoint_offset_periodNight Setback -4h	2.502e+00
## in.cooling_setpoint_offset_periodNight Setback -5h	1.830e+00
## in.cooling_setpoint_offset_periodNight Setback +1h	9.962e-01
## in.cooling_setpoint_offset_periodNight Setback +2h	1.062e+00
## in.cooling_setpoint_offset_periodNight Setback +3h	1.448e+00
## in.cooling_setpoint_offset_periodNight Setback +4h	-4.914e-03
## in.cooling_setpoint_offset_periodNight Setback +5h	5.808e-01
## in.cooling_setpoint_offset_periodNight Setup	-1.688e-01
## in.cooling_setpoint_offset_periodNight Setup -1h	-2.740e-01
## in.cooling_setpoint_offset_periodNight Setup -2h	-6.104e-01
## in.cooling_setpoint_offset_periodNight Setup -3h	3.393e-01
## in.cooling_setpoint_offset_periodNight Setup -4h	-1.859e-01
## in.cooling_setpoint_offset_periodNight Setup -5h	-3.142e-01
## in.cooling_setpoint_offset_periodNight Setup +1h	6.381e-01
## in.cooling_setpoint_offset_periodNight Setup +2h	-3.150e-01
## in.cooling_setpoint_offset_periodNight Setup +3h	5.304e-01
## in.cooling_setpoint_offset_periodNight Setup +4h	1.440e-01
## in.cooling_setpoint_offset_periodNight Setup +5h	2.264e-01
## in.cooling_setpoint_offset_periodNone	NA
## in.county_and_pumaG4500030, G45001500	NA
## in.county_and_pumaG4500050, G45001300	NA
## in.county_and_pumaG4500070, G45000200	NA
## in.county_and_pumaG4500090, G45001300	NA
## in.county_and_pumaG4500110, G45001300	NA
## in.county_and_pumaG4500130, G45001400	NA
## in.county_and_pumaG4500150, G45001201	-1.682e+00
## in.county_and_pumaG4500150, G45001202	4.080e-01
## in.county_and_pumaG4500150, G45001203	-1.703e+00
## in.county_and_pumaG4500150, G45001204	NA
## in.county_and_pumaG4500170, G45000605	NA
## in.county_and_pumaG4500190, G45001201	2.820e-01
## in.county_and_pumaG4500190, G45001202	-2.106e-01
## in.county_and_pumaG4500190, G45001203	7.904e-01
## in.county_and_pumaG4500190, G45001204	NA
## in.county_and_pumaG4500210, G45000400	NA
## in.county_and_pumaG4500230, G45000400	NA
## in.county_and_pumaG4500250, G45000700	NA
## in.county_and_pumaG4500270, G45000800	NA
## in.county_and_pumaG4500290, G45001300	NA
## in.county_and_pumaG4500310, G45000900	NA
## in.county_and_pumaG4500330, G45001000	NA
## in.county_and_pumaG4500350, G45001201	2.023e-01
## in.county_and_pumaG4500350, G45001204	NA
## in.county_and_pumaG4500370, G45001500	NA
## in.county_and_pumaG4500390, G45000603	NA
## in.county_and_pumaG4500410, G45000900	NA
## in.county_and_pumaG4500430, G45001000	NA
## in.county_and_pumaG4500450, G45000102	-1.247e-01
## in.county_and_pumaG4500450, G45000103	6.079e-01
## in.county_and_pumaG4500450, G45000104	7.854e-01
## in.county_and_pumaG4500450, G45000105	NA

## in.county_and_pumaG4500470, G45001600	NA
## in.county_and_pumaG4500490, G45001300	NA
## in.county_and_pumaG4500510, G45001101	4.986e-01
## in.county_and_pumaG4500510, G45001102	NA
## in.county_and_pumaG4500530, G45001400	NA
## in.county_and_pumaG4500550, G45000605	NA
## in.county_and_pumaG4500570, G45000700	NA
## in.county_and_pumaG4500590, G45000105	NA
## in.county_and_pumaG4500610, G45000800	NA
## in.county_and_pumaG4500630, G45000601	9.986e-02
## in.county_and_pumaG4500630, G45000602	NA
## in.county_and_pumaG4500650, G45001600	NA
## in.county_and_pumaG4500670, G45001000	NA
## in.county_and_pumaG4500690, G45000700	NA
## in.county_and_pumaG4500710, G45000400	NA
## in.county_and_pumaG4500730, G45000101	NA
## in.county_and_pumaG4500750, G45001300	NA
## in.county_and_pumaG4500770, G45000101	NA
## in.county_and_pumaG4500790, G45000603	1.299e+00
## in.county_and_pumaG4500790, G45000604	1.510e+00
## in.county_and_pumaG4500790, G45000605	NA
## in.county_and_pumaG4500810, G45000601	NA
## in.county_and_pumaG4500830, G45000301	-1.306e-01
## in.county_and_pumaG4500830, G45000302	NA
## in.county_and_pumaG4500850, G45000800	NA
## in.county_and_pumaG4500870, G45000400	NA
## in.county_and_pumaG4500890, G45000800	NA
## in.county_and_pumaG4500910, G45000501	-1.916e-01
## in.county_and_pumaG4500910, G45000502	NA
## in.dishwasher290 Rated kWh, 120% Usage	-8.141e-02
## in.dishwasher290 Rated kWh, 80% Usage	-1.428e-01
## in.dishwasher318 Rated kWh, 100% Usage	-7.433e-02
## in.dishwasher318 Rated kWh, 120% Usage	3.451e-01
## in.dishwasher318 Rated kWh, 80% Usage	1.678e-01
## in.dishwasherNone	-3.713e-01
## in.ducts10% Leakage, R-4	2.949e+00
## in.ducts10% Leakage, R-6	3.194e+00
## in.ducts10% Leakage, R-8	4.985e+00
## in.ducts10% Leakage, Uninsulated	1.504e+00
## in.ducts20% Leakage, R-4	3.015e+00
## in.ducts20% Leakage, R-6	4.347e+00
## in.ducts20% Leakage, R-8	4.440e+00
## in.ducts20% Leakage, Uninsulated	1.689e+00
## in.ducts30% Leakage, R-4	2.545e+00
## in.ducts30% Leakage, R-6	4.055e+00
## in.ducts30% Leakage, R-8	4.383e+00
## in.ducts30% Leakage, Uninsulated	3.349e+00
## in.ductsNone	-1.351e+00
## in.federal_poverty_level100-150%	2.655e-01
## in.federal_poverty_level150-200%	5.683e-02
## in.federal_poverty_level200-300%	2.804e-01
## in.federal_poverty_level300-400%	-3.238e-02
## in.federal_poverty_level400%+	2.793e-01
## in.geometry_attic_typeVented Attic	2.028e+00
## in.geometry_floor_area1000-1499	-1.454e+00
## in.geometry_floor_area1500-1999	-3.338e+00

## in.geometry_floor_area2000-2499	-5.772e+00
## in.geometry_floor_area2500-2999	-8.154e+00
## in.geometry_floor_area3000-3999	-1.129e+01
## in.geometry_floor_area4000+	-4.126e+01
## in.geometry_floor_area500-749	5.608e-02
## in.geometry_floor_area750-999	NA
## in.geometry_floor_area_bin1500-2499	NA
## in.geometry_floor_area_bin2500-3999	NA
## in.geometry_floor_area_bin4000+	NA
## in.geometry.foundation_typeHeated Basement	2.387e+00
## in.geometry.foundation_typeSlab	2.184e+00
## in.geometry.foundation_typeUnheated Basement	1.225e+00
## in.geometry.foundation_typeUnvented Crawlspace	1.085e+00
## in.geometry.foundation_typeVented Crawlspace	1.456e+00
## in.geometry_garage	-3.117e-01
## in.geometry_stories	4.722e-01
## in.geometry_stories_low_rise	NA
## in.geometry_wall_exterior_finishBrick, Light	-1.965e+00
## in.geometry_wall_exterior_finishBrick, Medium/Dark	3.862e-01
## in.geometry_wall_exterior_finishFiber-Cement, Light	-3.684e-01
## in.geometry_wall_exterior_finishNone	3.708e-02
## in.geometry_wall_exterior_finishShingle, Asbestos, Medium	6.144e-01
## in.geometry_wall_exterior_finishShingle, Composition, Medium	2.028e-01
## in.geometry_wall_exterior_finishStucco, Light	-4.478e-01
## in.geometry_wall_exterior_finishVinyl, Light	-2.005e-01
## in.geometry_wall_exterior_finishWood, Medium/Dark	2.770e-01
## in.geometry_wall_typeConcrete	1.694e+00
## in.geometry_wall_typeSteel Frame	3.764e-01
## in.geometry_wall_typeWood Frame	4.479e-01
## in.has_pvYes	3.107e+00
## in.heating_fuelFuel Oil	5.157e-01
## in.heating_fuelNatural Gas	1.654e-01
## in.heating_fuelNone	-5.428e-01
## in.heating_fuelOther Fuel	7.859e-02
## in.heating_fuelPropane	5.029e-01
## in.heating_setpoint	-1.693e-01
## in.heating_setpoint_has_offsetYes	-3.718e-01
## in.heating_setpoint_offset_magnitude	5.693e-02
## in.heating_setpoint_offset_periodDay -1h	-2.782e-01
## in.heating_setpoint_offset_periodDay -2h	2.876e-01
## in.heating_setpoint_offset_periodDay -3h	2.293e-01
## in.heating_setpoint_offset_periodDay -4h	-1.089e+00
## in.heating_setpoint_offset_periodDay -5h	3.705e-01
## in.heating_setpoint_offset_periodDay +1h	-9.313e-01
## in.heating_setpoint_offset_periodDay +2h	1.958e-01
## in.heating_setpoint_offset_periodDay +3h	2.978e-01
## in.heating_setpoint_offset_periodDay +4h	-1.513e-01
## in.heating_setpoint_offset_periodDay +5h	1.266e+00
## in.heating_setpoint_offset_periodDay and Night	1.193e+00
## in.heating_setpoint_offset_periodDay and Night -1h	3.098e-01
## in.heating_setpoint_offset_periodDay and Night -2h	-2.494e-01
## in.heating_setpoint_offset_periodDay and Night -3h	1.374e-01
## in.heating_setpoint_offset_periodDay and Night -4h	2.884e-01
## in.heating_setpoint_offset_periodDay and Night -5h	3.418e-01
## in.heating_setpoint_offset_periodDay and Night +1h	7.674e-01
## in.heating_setpoint_offset_periodDay and Night +2h	1.602e-01

## in.heating_setpoint_offset_periodDay and Night +3h	1.160e+00
## in.heating_setpoint_offset_periodDay and Night +4h	-3.496e-01
## in.heating_setpoint_offset_periodDay and Night +5h	6.797e-01
## in.heating_setpoint_offset_periodNight	1.198e-02
## in.heating_setpoint_offset_periodNight -1h	1.019e+00
## in.heating_setpoint_offset_periodNight -2h	-3.125e-01
## in.heating_setpoint_offset_periodNight -3h	7.807e-01
## in.heating_setpoint_offset_periodNight -4h	5.079e-01
## in.heating_setpoint_offset_periodNight -5h	-8.838e-02
## in.heating_setpoint_offset_periodNight +1h	-8.055e-03
## in.heating_setpoint_offset_periodNight +2h	4.645e-01
## in.heating_setpoint_offset_periodNight +3h	-2.505e-01
## in.heating_setpoint_offset_periodNight +4h	4.094e-01
## in.heating_setpoint_offset_periodNight +5h	3.688e-01
## in.heating_setpoint_offset_periodNone	NA
## in.hot_water_fixtures200% Usage	8.995e+00
## in.hot_water_fixtures50% Usage	-3.081e+00
## in.hvac_cooling_efficiencyAC, SEER 13	-1.204e-03
## in.hvac_cooling_efficiencyAC, SEER 15	-8.760e-02
## in.hvac_cooling_efficiencyAC, SEER 8	7.195e-02
## in.hvac_cooling_efficiencyHeat Pump	-7.990e-01
## in.hvac_cooling_efficiencyNone	-6.083e-01
## in.hvac_cooling_efficiencyRoom AC, EER 10.7	-5.840e-02
## in.hvac_cooling_efficiencyRoom AC, EER 12.0	3.482e-01
## in.hvac_cooling_efficiencyRoom AC, EER 8.5	6.653e-01
## in.hvac_cooling_efficiencyRoom AC, EER 9.8	-1.553e-01
## in.hvac_cooling_partial_space_conditioning20% Conditioned	-3.294e-01
## in.hvac_cooling_partial_space_conditioning40% Conditioned	-7.344e-01
## in.hvac_cooling_partial_space_conditioning60% Conditioned	-5.229e-02
## in.hvac_cooling_partial_space_conditioning80% Conditioned	-2.511e-01
## in.hvac_cooling_partial_space_conditioningNone	NA
## in.hvac_cooling_typeHeat Pump	NA
## in.hvac_cooling_typeNone	NA
## in.hvac_cooling_typeRoom AC	NA
## in.hvac_has_ductsYes	NA
## in.hvac_has_zonal_electric_heatingYes	-1.960e-01
## in.hvac_heating_efficiencyASHP, SEER 13, 7.7 HSPF	5.349e-01
## in.hvac_heating_efficiencyASHP, SEER 15, 8.5 HSPF	4.634e-01
## in.hvac_heating_efficiencyElectric Baseboard, 100% Efficiency	NA
## in.hvac_heating_efficiencyElectric Boiler, 100% AFUE	-2.677e+00
## in.hvac_heating_efficiencyElectric Furnace, 100% AFUE	3.600e-01
## in.hvac_heating_efficiencyElectric Wall Furnace, 100% AFUE	NA
## in.hvac_heating_efficiencyFuel Boiler, 76% AFUE	-2.177e+00
## in.hvac_heating_efficiencyFuel Boiler, 80% AFUE	-2.344e+00
## in.hvac_heating_efficiencyFuel Boiler, 90% AFUE	-1.044e+00
## in.hvac_heating_efficiencyFuel Furnace, 60% AFUE	-1.184e+00
## in.hvac_heating_efficiencyFuel Furnace, 76% AFUE	-1.786e-01
## in.hvac_heating_efficiencyFuel Furnace, 80% AFUE	-3.089e-01
## in.hvac_heating_efficiencyFuel Furnace, 92.5% AFUE	-5.302e-01
## in.hvac_heating_efficiencyFuel Wall/Floor Furnace, 60% AFUE	-3.546e-01
## in.hvac_heating_efficiencyFuel Wall/Floor Furnace, 68% AFUE	NA
## in.hvac_heating_efficiencyNone	NA
## in.hvac_heating_efficiencyOther	NA
## in.hvac_heating_typeDucted Heating	-6.985e-01
## in.hvac_heating_typeNon-Ducted Heating	NA
## in.hvac_heating_typeNone	NA

## in.hvac_heating_type_and_fuelElectricity Baseboard	NA
## in.hvac_heating_type_and_fuelElectricity Electric Boiler	NA
## in.hvac_heating_type_and_fuelElectricity Electric Furnace	NA
## in.hvac_heating_type_and_fuelElectricity Electric Wall Furnace	NA
## in.hvac_heating_type_and_fuelFuel Oil Fuel Boiler	8.483e-01
## in.hvac_heating_type_and_fuelFuel Oil Fuel Furnace	-6.385e-01
## in.hvac_heating_type_and_fuelFuel Oil Fuel Wall/Floor Furnace	NA
## in.hvac_heating_type_and_fuelNatural Gas Fuel Boiler	1.967e+00
## in.hvac_heating_type_and_fuelNatural Gas Fuel Furnace	6.289e-01
## in.hvac_heating_type_and_fuelNatural Gas Fuel Wall/Floor Furnace	NA
## in.hvac_heating_type_and_fuelNone	NA
## in.hvac_heating_type_and_fuelPropane Fuel Boiler	NA
## in.hvac_heating_type_and_fuelPropane Fuel Furnace	NA
## in.hvac_heating_type_and_fuelPropane Fuel Wall/Floor Furnace	NA
## in.income	-4.086e-06
## in.income_recs_2015	9.619e-06
## in.income_recs_2020	-4.745e-06
## in.infiltration	4.405e-02
## in.insulation_ceilingR-13	-1.860e-02
## in.insulation_ceilingR-19	-2.236e-01
## in.insulation_ceilingR-30	-1.200e-02
## in.insulation_ceilingR-38	9.628e-02
## in.insulation_ceilingR-49	-1.205e+00
## in.insulation_ceilingR-7	2.778e-01
## in.insulation_ceilingUninsulated	NA
## in.insulation_floorCeiling R-19	1.459e-01
## in.insulation_floorNone	NA
## in.insulation_floorUninsulated	9.254e-01
## in.insulation.foundation_wallUninsulated	2.428e+00
## in.insulation.foundation_wallWall R-10, Exterior	-7.990e-01
## in.insulation.foundation_wallWall R-15, Exterior	3.507e-03
## in.insulation.foundation_wallWall R-5, Exterior	NA
## in.insulation_rim_joistR-10, Exterior	NA
## in.insulation_rim_joistR-15, Exterior	NA
## in.insulation_rim_joistR-5, Exterior	NA
## in.insulation_rim_joistUninsulated	NA
## in.insulation_roofFinished, R-19	-6.720e-02
## in.insulation_roofFinished, R-30	-1.679e+00
## in.insulation_roofFinished, R-38	-3.790e-01
## in.insulation_roofFinished, R-49	-1.184e-01
## in.insulation_roofFinished, R-7	1.660e+00
## in.insulation_roofFinished, Uninsulated	-2.600e+00
## in.insulation_roofUnfinished, Uninsulated	NA
## in.insulation_slab2ft R10 Under, Horizontal	1.892e-01
## in.insulation_slab2ft R5 Perimeter, Vertical	-2.954e-02
## in.insulation_slab2ft R5 Under, Horizontal	4.092e-01
## in.insulation_slabNone	NA
## in.insulation_slabUninsulated	3.669e-01
## in.insulation_wallBrick, 12-in, 3-wythe, R-15	-6.842e-01
## in.insulation_wallBrick, 12-in, 3-wythe, R-19	1.341e-01
## in.insulation_wallBrick, 12-in, 3-wythe, R-7	8.720e-01
## in.insulation_wallBrick, 12-in, 3-wythe, Uninsulated	1.843e+00
## in.insulation_wallCMU, 6-in Hollow, R-11	-1.721e+00
## in.insulation_wallCMU, 6-in Hollow, R-15	-3.034e+00
## in.insulation_wallCMU, 6-in Hollow, R-19	-1.865e+00
## in.insulation_wallCMU, 6-in Hollow, R-7	1.478e-01

## in.insulation_wallCMU, 6-in Hollow, Uninsulated	NA
## in.insulation_wallWood Stud, R-11	-2.488e-01
## in.insulation_wallWood Stud, R-15	-5.408e-02
## in.insulation_wallWood Stud, R-19	-5.139e-01
## in.insulation_wallWood Stud, R-7	5.248e-01
## in.insulation_wallWood Stud, Uninsulated	NA
## in.lighting100% Incandescent	4.011e+00
## in.lighting100% LED	-4.126e-01
## in.misc_extra_refrigeratorEF 10.5	-3.804e-01
## in.misc_extra_refrigeratorEF 15.9	-8.213e-01
## in.misc_extra_refrigeratorEF 17.6	-9.208e-01
## in.misc_extra_refrigeratorEF 19.9	-5.938e-01
## in.misc_extra_refrigeratorEF 6.7	1.777e+00
## in.misc_extra_refrigeratorNone	-2.302e+00
## in.misc_freezerNone	-1.098e+00
## in.misc_gas_fireplaceNone	-4.310e+00
## in.misc_gas_grillNone	-1.875e+00
## in.misc_gas_lightingNone	-1.369e+00
## in.misc_hot_tub_spagass	3.734e+00
## in.misc_hot_tub_spaNone	-6.677e+00
## in.misc_poolNone	-5.569e+00
## in.misc_pool_heaterGas	1.038e+01
## in.misc_pool_heaterNone	-4.900e+00
## in.misc_pool_heaterSolar	-5.729e+00
## in.misc_pool_pumpNone	NA
## in.misc_well_pumpTypical Efficiency	8.224e-01
## in.occupants10+	2.526e+01
## in.occupants2	1.887e+00
## in.occupants3	3.977e+00
## in.occupants4	5.845e+00
## in.occupants5	7.849e+00
## in.occupants6	9.459e+00
## in.occupants7	1.213e+01
## in.occupants8	1.342e+01
## in.occupants9	1.528e+01
## in.orientationNorth	-9.597e-01
## in.orientationNortheast	-5.384e-01
## in.orientationNorthwest	-1.859e-01
## in.orientationSouth	-9.147e-01
## in.orientationSoutheast	-1.517e-01
## in.orientationSouthwest	-7.729e-02
## in.orientationWest	-1.871e-01
## in.plug_load_diversity200%	NA
## in.plug_load_diversity50%	NA
## in.pumaG45000102	NA
## in.pumaG45000103	NA
## in.pumaG45000104	NA
## in.pumaG45000105	NA
## in.pumaG45000200	NA
## in.pumaG45000301	NA
## in.pumaG45000302	NA
## in.pumaG45000400	NA
## in.pumaG45000501	NA
## in.pumaG45000502	NA
## in.pumaG45000601	NA
## in.pumaG45000602	NA

## in.pumaG45000603	NA
## in.pumaG45000604	NA
## in.pumaG45000605	NA
## in.pumaG45000700	NA
## in.pumaG45000800	NA
## in.pumaG45000900	NA
## in.pumaG45001000	NA
## in.pumaG45001101	NA
## in.pumaG45001102	NA
## in.pumaG45001201	NA
## in.pumaG45001202	NA
## in.pumaG45001203	NA
## in.pumaG45001204	NA
## in.pumaG45001300	NA
## in.pumaG45001400	NA
## in.pumaG45001500	NA
## in.pumaG45001600	NA
## in.puma_metro_statusNot/partially in metro area	NA
## in.pv_orientationNone	NA
## in.pv_orientationNorth	4.010e+00
## in.pv_orientationSouth	6.028e-01
## in.pv_orientationSoutheast	3.781e-01
## in.pv_orientationSouthwest	3.443e-01
## in.pv_orientationWest	3.598e+00
## in.pv_system_size11.0 kWDC	4.105e+01
## in.pv_system_size13.0 kWDC	5.260e+01
## in.pv_system_size3.0 kWDC	9.085e+00
## in.pv_system_size5.0 kWDC	1.574e+01
## in.pv_system_size7.0 kWDC	2.637e+01
## in.pv_system_size9.0 kWDC	3.408e+01
## in.pv_system_sizeNone	NA
## in.range_spot_vent_hour	-8.940e-03
## in.reeds_balancing_area	NA
## in.refrigeratorEF 10.5, 100% Usage	-2.928e-01
## in.refrigeratorEF 15.9, 100% Usage	-1.259e+00
## in.refrigeratorEF 17.6, 100% Usage	-1.275e+00
## in.refrigeratorEF 19.9, 100% Usage	-1.755e+00
## in.refrigeratorEF 6.7, 100% Usage	2.321e+00
## in.refrigeratorNone	-2.601e+00
## in.roof_materialComposition Shingles	8.993e-02
## in.roof_materialMetal, Dark	3.299e-01
## in.roof_materialSlate	1.870e-03
## in.roof_materialTile, Clay or Ceramic	1.515e-01
## in.roof_materialTile, Concrete	2.796e-02
## in.roof_materialWood Shingles	1.883e-01
## in.tenureRenter	2.197e-01
## in.usage_levelLow	NA
## in.usage_levelMedium	NA
## in.vacancy_statusVacant	-1.870e+01
## in.vintage1940s	-3.654e-03
## in.vintage1950s	-2.123e-01
## in.vintage1960s	-3.912e-01
## in.vintage1970s	-2.747e-01
## in.vintage1980s	4.428e-01
## in.vintage1990s	2.561e-01
## in.vintage2000s	-1.889e+00

## in.vintage2010s	-2.154e+00
## in.vintage_acs1940-59	NA
## in.vintage_acs1960-79	NA
## in.vintage_acs1980-99	NA
## in.vintage_acs2000-09	NA
## in.vintage_acs2010s	NA
## in.water_heater_efficiencyElectric Premium	7.144e-01
## in.water_heater_efficiencyElectric Standard	3.933e-01
## in.water_heater_efficiencyElectric Tankless	4.443e+00
## in.water_heater_efficiencyFuel Oil Standard	2.424e-01
## in.water_heater_efficiencyNatural Gas Premium	5.011e-01
## in.water_heater_efficiencyNatural Gas Standard	4.036e-01
## in.water_heater_efficiencyNatural Gas Tankless	1.479e+00
## in.water_heater_efficiencyOther Fuel	1.086e+00
## in.water_heater_efficiencyPropane Premium	-8.788e-01
## in.water_heater_efficiencyPropane Standard	4.141e-02
## in.water_heater_efficiencyPropane Tankless	-8.609e-02
## in.water_heater_fuelFuel Oil	NA
## in.water_heater_fuelNatural Gas	NA
## in.water_heater_fuelOther Fuel	NA
## in.water_heater_fuelPropane	NA
## in.weather_file_cityAugusta Bush Field	NA
## in.weather_file_cityBeaufort Mcas	NA
## in.weather_file_cityCharleston Muni	NA
## in.weather_file_cityColumbia Metro	NA
## in.weather_file_cityColumbia Owens Apt	NA
## in.weather_file_cityDaniel Field	NA
## in.weather_file_cityFlorence Rgnl	NA
## in.weather_file_cityGreenville Greenvil	NA
## in.weather_file_cityGreenwood Co	NA
## in.weather_file_cityMaxton	NA
## in.weather_file_cityMonroe Airport	NA
## in.weather_file_cityMyrtle Beach Civ	NA
## in.weather_file_cityOconee Co Rgnl	NA
## in.weather_file_cityOrangeburg Muni	NA
## in.weather_file_cityRock Hill York Co	NA
## in.weather_file_cityRutherfordton	NA
## in.weather_file_cityShaw Afb Sumter	NA
## in.weather_file_latitude	NA
## in.weather_file_longitude	-1.017e+08
## in.window_areasF15 B15 L15 R15	4.779e-01
## in.window_areasF18 B18 L18 R18	1.157e+00
## in.window_areasF30 B30 L30 R30	3.653e+00
## in.window_areasF6 B6 L6 R6	-8.220e-01
## in.window_areasF9 B9 L9 R9	-4.347e-01
## in.windowsDouble, Clear, Metal, Air, Exterior Clear Storm	-4.569e-02
## in.windowsDouble, Clear, Non-metal, Air	-5.097e-01
## in.windowsDouble, Clear, Non-metal, Air, Exterior Clear Storm	-6.364e-01
## in.windowsDouble, Low-E, Non-metal, Air, M-Gain	-1.014e+00
## in.windowsSingle, Clear, Metal	1.650e-01
## in.windowsSingle, Clear, Metal, Exterior Clear Storm	-8.153e-01
## in.windowsSingle, Clear, Non-metal	-1.604e-01
## in.windowsSingle, Clear, Non-metal, Exterior Clear Storm	-1.166e+00
## in.windowsTriple, Low-E, Non-metal, Air, L-Gain	-1.477e+00
## upgrade.insulation_roofFinished, R-30	NA
## upgrade.water_heater_efficiencyElectric Heat Pump, 50 gal, 3.45 UEF	1.355e-01

## upgrade.water_heater_efficiencyElectric Heat Pump, 66 gal, 3.35 UEF	5.852e-02
## upgrade.water_heater_efficiencyElectric Heat Pump, 80 gal, 3.45 UEF	NA
## upgrade.infiltration_reduction30%	3.248e-02
## upgrade.geometry.foundation_typeUnvented Crawlspace	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 100% Usage	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 120% Usage	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 80% Usage	NA
## upgrade.insulation_ceilingR-49	NA
## upgrade.ducts10% Leakage, R-8	NA
## upgrade.hvac_heating_typeDucted Heat Pump	NA
## upgrade.insulation_wallWood Stud, R-13	NA
## upgrade.insulation.foundation_wallWall R-10, Interior	-2.544e+00
## upgrade.hvac_heating_efficiencyMSHP, SEER 29.3, 14 HSPF, Max Load	NA
## upgrade.cooking_rangeElectric, Induction, 100% Usage	NA
## upgrade.cooking_rangeElectric, Induction, 120% Usage	NA
## upgrade.cooking_rangeElectric, Induction, 80% Usage	NA
## county_idG4500030	NA
## county_idG4500050	NA
## county_idG4500070	NA
## county_idG4500090	NA
## county_idG4500110	NA
## county_idG4500130	NA
## county_idG4500150	NA
## county_idG4500170	NA
## county_idG4500190	NA
## county_idG4500210	NA
## county_idG4500230	NA
## county_idG4500250	NA
## county_idG4500270	NA
## county_idG4500290	NA
## county_idG4500310	NA
## county_idG4500330	NA
## county_idG4500350	NA
## county_idG4500370	NA
## county_idG4500390	NA
## county_idG4500410	NA
## county_idG4500430	NA
## county_idG4500450	NA
## county_idG4500470	NA
## county_idG4500490	NA
## county_idG4500510	NA
## county_idG4500530	NA
## county_idG4500550	NA
## county_idG4500570	NA
## county_idG4500590	NA
## county_idG4500610	NA
## county_idG4500630	NA
## county_idG4500650	NA
## county_idG4500670	NA
## county_idG4500690	NA
## county_idG4500710	NA
## county_idG4500730	NA
## county_idG4500750	NA
## county_idG4500770	NA
## county_idG4500790	NA
## county_idG4500810	NA

## county_idG4500830	NA
## county_idG4500850	NA
## county_idG4500870	NA
## county_idG4500890	NA
## county_idG4500910	NA
## date_time2018-07-02	NA
## date_time2018-07-03	NA
## date_time2018-07-04	NA
## date_time2018-07-05	NA
## date_time2018-07-06	NA
## date_time2018-07-07	NA
## date_time2018-07-08	NA
## date_time2018-07-09	NA
## date_time2018-07-10	NA
## date_time2018-07-11	NA
## date_time2018-07-12	NA
## date_time2018-07-13	NA
## date_time2018-07-14	NA
## date_time2018-07-15	NA
## date_time2018-07-16	NA
## date_time2018-07-17	NA
## date_time2018-07-18	NA
## date_time2018-07-19	NA
## date_time2018-07-20	NA
## date_time2018-07-21	NA
## date_time2018-07-22	NA
## date_time2018-07-23	NA
## date_time2018-07-24	NA
## date_time2018-07-25	NA
## date_time2018-07-26	NA
## date_time2018-07-27	NA
## date_time2018-07-28	NA
## date_time2018-07-29	NA
## date_time2018-07-30	NA
## date_time2018-07-31	NA
## Direct_Normal_Radiation	2.516e-03
## Diffuse_Horizontal_Radiation	4.735e-03
## Dry_Bulb_Temperature	1.240e+00
## Relative_Humidity	-2.821e-03
## Wind_Speed	2.560e-01
## Wind_Direction	1.490e-03
## Global_Horizontal_Radiation	6.950e-03
##	Std. Error
## (Intercept)	1.717e+10
## in.countyG4500030	3.970e+07
## in.countyG4500050	2.716e+08
## in.countyG4500070	1.149e+08
## in.countyG4500090	2.716e+08
## in.countyG4500110	2.716e+08
## in.countyG4500130	3.009e+08
## in.countyG4500150	4.430e+08
## in.countyG4500170	2.716e+08
## in.countyG4500190	4.430e+08
## in.countyG4500210	4.806e+07
## in.countyG4500230	2.298e+08
## in.countyG4500250	3.218e+08

## in.countyG4500270	3.510e+08
## in.countyG4500290	3.009e+08
## in.countyG4500310	5.077e+08
## in.countyG4500330	5.830e+08
## in.countyG4500350	4.430e+08
## in.countyG4500370	2.507e+07
## in.countyG4500390	2.424e+08
## in.countyG4500410	5.077e+08
## in.countyG4500430	6.770e+08
## in.countyG4500450	1.254e+07
## in.countyG4500470	2.051e-01
## in.countyG4500490	3.009e+08
## in.countyG4500510	6.770e+08
## in.countyG4500530	3.009e+08
## in.countyG4500550	3.510e+08
## in.countyG4500570	3.218e+08
## in.countyG4500590	2.054e-01
## in.countyG4500610	3.510e+08
## in.countyG4500630	2.173e+08
## in.countyG4500650	2.863e-01
## in.countyG4500670	5.077e+08
## in.countyG4500690	5.830e+08
## in.countyG4500710	2.173e+08
## in.countyG4500730	1.525e+08
## in.countyG4500750	2.716e+08
## in.countyG4500770	1.525e+08
## in.countyG4500790	2.424e+08
## in.countyG4500810	2.689e-01
## in.countyG4500830	1.254e+07
## in.countyG4500850	3.510e+08
## in.countyG4500870	1.254e+07
## in.countyG4500890	5.077e+08
## in.countyG4500910	2.298e+08
## date2018-07-02	1.006e-01
## date2018-07-03	9.997e-02
## date2018-07-04	1.022e-01
## date2018-07-05	9.825e-02
## date2018-07-06	1.008e-01
## date2018-07-07	1.241e-01
## date2018-07-08	1.416e-01
## date2018-07-09	1.422e-01
## date2018-07-10	1.265e-01
## date2018-07-11	1.139e-01
## date2018-07-12	1.043e-01
## date2018-07-13	1.087e-01
## date2018-07-14	1.023e-01
## date2018-07-15	1.058e-01
## date2018-07-16	1.135e-01
## date2018-07-17	1.159e-01
## date2018-07-18	1.059e-01
## date2018-07-19	1.128e-01
## date2018-07-20	1.152e-01
## date2018-07-21	1.236e-01
## date2018-07-22	1.182e-01
## date2018-07-23	1.190e-01
## date2018-07-24	1.093e-01

## date2018-07-25	1.060e-01
## date2018-07-26	1.025e-01
## date2018-07-27	1.018e-01
## date2018-07-28	1.024e-01
## date2018-07-29	1.061e-01
## date2018-07-30	1.079e-01
## date2018-07-31	1.145e-01
## bldg_id	8.002e-08
## in.sqft	3.710e-04
## in.bathroom_spot_vent_hour	1.569e-03
## in.bedrooms	3.574e-02
## in.building_americazoneMixed-Humid	NA
## in.ceiling_fanStandard Efficiency	2.984e-02
## in.ceiling_fanStandard Efficiency, No usage	8.095e-02
## in.cityNot in a census Place	3.010e-02
## in.citySC, Charleston	1.281e-01
## in.citySC, Columbia	1.280e-01
## in.citySC, Florence	1.641e-01
## in.citySC, Goose Creek	2.012e-01
## in.citySC, Greenville	1.695e-01
## in.citySC, Hilton Head Island	1.314e-01
## in.citySC, Mount Pleasant	2.025e-01
## in.citySC, Myrtle Beach	1.680e-01
## in.citySC, North Charleston	2.474e-01
## in.citySC, North Myrtle Beach	1.712e-01
## in.citySC, Rock Hill	1.541e-01
## in.citySC, Spartanburg	1.698e-01
## in.citySC, Summerville	1.609e-01
## in.citySC, Sumter	1.819e-01
## in.clothes_dryerElectric, 120% Usage	2.389e-01
## in.clothes_dryerElectric, 80% Usage	2.538e-01
## in.clothes_dryerGas, 100% Usage	8.230e-02
## in.clothes_dryerGas, 120% Usage	2.622e-01
## in.clothes_dryerGas, 80% Usage	2.740e-01
## in.clothes_dryerNone	1.426e-01
## in.clothes_dryerPropane, 100% Usage	1.729e-01
## in.clothes_dryerPropane, 120% Usage	3.728e-01
## in.clothes_dryerPropane, 80% Usage	3.388e-01
## in.clothes_washerEnergyStar, 120% Usage	3.277e-01
## in.clothes_washerEnergyStar, 80% Usage	3.250e-01
## in.clothes_washerNone	1.893e-01
## in.clothes_washerStandard, 100% Usage	3.722e-02
## in.clothes_washerStandard, 120% Usage	3.304e-01
## in.clothes_washerStandard, 80% Usage	3.278e-01
## in.clothes_washer_presenceYes	NA
## in.cooking_rangeElectric, 120% Usage	2.813e-01
## in.cooking_rangeElectric, 80% Usage	2.899e-01
## in.cooking_rangeGas, 100% Usage	4.676e-02
## in.cooking_rangeGas, 120% Usage	2.858e-01
## in.cooking_rangeGas, 80% Usage	2.938e-01
## in.cooking_rangeNone	1.867e-01
## in.cooking_rangePropane, 100% Usage	8.006e-02
## in.cooking_rangePropane, 120% Usage	3.037e-01
## in.cooking_rangePropane, 80% Usage	3.063e-01
## in.cooling_setpoint	3.256e-03
## in.cooling_setpoint_has_offsetYes	1.928e-01

## in.cooling_setpoint_offset_magnitude	8.840e-03
## in.cooling_setpoint_offset_periodDay and Night Setup -1h	3.122e-01
## in.cooling_setpoint_offset_periodDay and Night Setup -2h	2.938e-01
## in.cooling_setpoint_offset_periodDay and Night Setup -3h	3.134e-01
## in.cooling_setpoint_offset_periodDay and Night Setup -4h	2.884e-01
## in.cooling_setpoint_offset_periodDay and Night Setup -5h	3.071e-01
## in.cooling_setpoint_offset_periodDay and Night Setup +1h	3.252e-01
## in.cooling_setpoint_offset_periodDay and Night Setup +2h	2.683e-01
## in.cooling_setpoint_offset_periodDay and Night Setup +3h	2.691e-01
## in.cooling_setpoint_offset_periodDay and Night Setup +4h	2.927e-01
## in.cooling_setpoint_offset_periodDay and Night Setup +5h	2.894e-01
## in.cooling_setpoint_offset_periodDay Setup	2.345e-01
## in.cooling_setpoint_offset_periodDay Setup -1h	2.380e-01
## in.cooling_setpoint_offset_periodDay Setup -2h	2.388e-01
## in.cooling_setpoint_offset_periodDay Setup -3h	2.380e-01
## in.cooling_setpoint_offset_periodDay Setup -4h	2.292e-01
## in.cooling_setpoint_offset_periodDay Setup -5h	2.356e-01
## in.cooling_setpoint_offset_periodDay Setup +1h	2.350e-01
## in.cooling_setpoint_offset_periodDay Setup +2h	2.424e-01
## in.cooling_setpoint_offset_periodDay Setup +3h	2.346e-01
## in.cooling_setpoint_offset_periodDay Setup +4h	2.363e-01
## in.cooling_setpoint_offset_periodDay Setup +5h	2.313e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback	2.718e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -1h	2.578e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -2h	2.637e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -3h	2.793e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -4h	2.779e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -5h	2.554e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +1h	2.774e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +2h	2.616e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +3h	2.600e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +4h	2.821e-01
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +5h	2.865e-01
## in.cooling_setpoint_offset_periodNight Setback	2.305e-01
## in.cooling_setpoint_offset_periodNight Setback -1h	2.317e-01
## in.cooling_setpoint_offset_periodNight Setback -2h	2.327e-01
## in.cooling_setpoint_offset_periodNight Setback -3h	2.303e-01
## in.cooling_setpoint_offset_periodNight Setback -4h	2.345e-01
## in.cooling_setpoint_offset_periodNight Setback -5h	2.261e-01
## in.cooling_setpoint_offset_periodNight Setback +1h	2.379e-01
## in.cooling_setpoint_offset_periodNight Setback +2h	2.304e-01
## in.cooling_setpoint_offset_periodNight Setback +3h	2.229e-01
## in.cooling_setpoint_offset_periodNight Setback +4h	2.287e-01
## in.cooling_setpoint_offset_periodNight Setback +5h	2.256e-01
## in.cooling_setpoint_offset_periodNight Setup	2.359e-01
## in.cooling_setpoint_offset_periodNight Setup -1h	2.345e-01
## in.cooling_setpoint_offset_periodNight Setup -2h	2.423e-01
## in.cooling_setpoint_offset_periodNight Setup -3h	2.332e-01
## in.cooling_setpoint_offset_periodNight Setup -4h	2.260e-01
## in.cooling_setpoint_offset_periodNight Setup -5h	2.402e-01
## in.cooling_setpoint_offset_periodNight Setup +1h	2.545e-01
## in.cooling_setpoint_offset_periodNight Setup +2h	2.261e-01
## in.cooling_setpoint_offset_periodNight Setup +3h	2.453e-01
## in.cooling_setpoint_offset_periodNight Setup +4h	2.269e-01
## in.cooling_setpoint_offset_periodNight Setup +5h	2.361e-01
## in.cooling_setpoint_offset_periodNone	NA

## in.county_and_pumaG4500030, G45001500	NA
## in.county_and_pumaG4500050, G45001300	NA
## in.county_and_pumaG4500070, G45000200	NA
## in.county_and_pumaG4500090, G45001300	NA
## in.county_and_pumaG4500110, G45001300	NA
## in.county_and_pumaG4500130, G45001400	NA
## in.county_and_pumaG4500150, G45001201	2.034e-01
## in.county_and_pumaG4500150, G45001202	3.014e-01
## in.county_and_pumaG4500150, G45001203	1.842e-01
## in.county_and_pumaG4500150, G45001204	NA
## in.county_and_pumaG4500170, G45000605	NA
## in.county_and_pumaG4500190, G45001201	3.829e-01
## in.county_and_pumaG4500190, G45001202	2.705e-01
## in.county_and_pumaG4500190, G45001203	3.100e-01
## in.county_and_pumaG4500190, G45001204	NA
## in.county_and_pumaG4500210, G45000400	NA
## in.county_and_pumaG4500230, G45000400	NA
## in.county_and_pumaG4500250, G45000700	NA
## in.county_and_pumaG4500270, G45000800	NA
## in.county_and_pumaG4500290, G45001300	NA
## in.county_and_pumaG4500310, G45000900	NA
## in.county_and_pumaG4500330, G45001000	NA
## in.county_and_pumaG4500350, G45001201	2.351e-01
## in.county_and_pumaG4500350, G45001204	NA
## in.county_and_pumaG4500370, G45001500	NA
## in.county_and_pumaG4500390, G45000603	NA
## in.county_and_pumaG4500410, G45000900	NA
## in.county_and_pumaG4500430, G45001000	NA
## in.county_and_pumaG4500450, G45000102	1.218e-01
## in.county_and_pumaG4500450, G45000103	1.138e-01
## in.county_and_pumaG4500450, G45000104	1.585e-01
## in.county_and_pumaG4500450, G45000105	NA
## in.county_and_pumaG4500470, G45001600	NA
## in.county_and_pumaG4500490, G45001300	NA
## in.county_and_pumaG4500510, G45001101	1.117e-01
## in.county_and_pumaG4500510, G45001102	NA
## in.county_and_pumaG4500530, G45001400	NA
## in.county_and_pumaG4500550, G45000605	NA
## in.county_and_pumaG4500570, G45000700	NA
## in.county_and_pumaG4500590, G45000105	NA
## in.county_and_pumaG4500610, G45000800	NA
## in.county_and_pumaG4500630, G45000601	1.047e-01
## in.county_and_pumaG4500630, G45000602	NA
## in.county_and_pumaG4500650, G45001600	NA
## in.county_and_pumaG4500670, G45001000	NA
## in.county_and_pumaG4500690, G45000700	NA
## in.county_and_pumaG4500710, G45000400	NA
## in.county_and_pumaG4500730, G45000101	NA
## in.county_and_pumaG4500750, G45001300	NA
## in.county_and_pumaG4500770, G45000101	NA
## in.county_and_pumaG4500790, G45000603	1.656e-01
## in.county_and_pumaG4500790, G45000604	1.782e-01
## in.county_and_pumaG4500790, G45000605	NA
## in.county_and_pumaG4500810, G45000601	NA
## in.county_and_pumaG4500830, G45000301	1.178e-01
## in.county_and_pumaG4500830, G45000302	NA

## in.county_and_pumaG4500850, G45000800	NA
## in.county_and_pumaG4500870, G45000400	NA
## in.county_and_pumaG4500890, G45000800	NA
## in.county_and_pumaG4500910, G45000501	1.393e-01
## in.county_and_pumaG4500910, G45000502	NA
## in.dishwasher290 Rated kWh, 120% Usage	7.055e-02
## in.dishwasher290 Rated kWh, 80% Usage	7.048e-02
## in.dishwasher318 Rated kWh, 100% Usage	5.326e-02
## in.dishwasher318 Rated kWh, 120% Usage	8.010e-02
## in.dishwasher318 Rated kWh, 80% Usage	8.010e-02
## in.dishwasherNone	4.045e-02
## in.ducts10% Leakage, R-4	5.666e-01
## in.ducts10% Leakage, R-6	5.882e-01
## in.ducts10% Leakage, R-8	5.814e-01
## in.ducts10% Leakage, Uninsulated	5.672e-01
## in.ducts20% Leakage, R-4	5.656e-01
## in.ducts20% Leakage, R-6	5.852e-01
## in.ducts20% Leakage, R-8	5.807e-01
## in.ducts20% Leakage, Uninsulated	5.666e-01
## in.ducts30% Leakage, R-4	5.661e-01
## in.ducts30% Leakage, R-6	5.880e-01
## in.ducts30% Leakage, R-8	5.813e-01
## in.ducts30% Leakage, Uninsulated	5.673e-01
## in.ductsNone	5.726e-01
## in.federal_poverty_level100-150%	5.945e-02
## in.federal_poverty_level150-200%	6.155e-02
## in.federal_poverty_level200-300%	5.464e-02
## in.federal_poverty_level300-400%	6.298e-02
## in.federal_poverty_level400%+	7.864e-02
## in.geometry_attic_typeVented Attic	2.879e-01
## in.geometry_floor_area1000-1499	1.503e-01
## in.geometry_floor_area1500-1999	3.171e-01
## in.geometry_floor_area2000-2499	4.952e-01
## in.geometry_floor_area2500-2999	6.752e-01
## in.geometry_floor_area3000-3999	9.107e-01
## in.geometry_floor_area4000+	2.724e+00
## in.geometry_floor_area500-749	1.517e-01
## in.geometry_floor_area750-999	NA
## in.geometry_floor_area_bin1500-2499	NA
## in.geometry_floor_area_bin2500-3999	NA
## in.geometry_floor_area_bin4000+	NA
## in.geometry.foundation_typeHeated Basement	6.376e-01
## in.geometry.foundation_typeSlab	1.187e-01
## in.geometry.foundation_typeUnheated Basement	3.421e-01
## in.geometry.foundation_typeUnvented Crawlspace	4.728e-01
## in.geometry.foundation_typeVented Crawlspace	4.838e-01
## in.geometry_garage	1.675e-02
## in.geometry_stories	2.739e-02
## in.geometry_stories_low_rise	NA
## in.geometry_wall_exterior_finishBrick, Light	9.753e-01
## in.geometry_wall_exterior_finishBrick, Medium/Dark	1.832e-01
## in.geometry_wall_exterior_finishFiber-Cement, Light	2.156e-01
## in.geometry_wall_exterior_finishNone	2.067e-01
## in.geometry_wall_exterior_finishShingle, Asbestos, Medium	2.254e-01
## in.geometry_wall_exterior_finishShingle, Composition, Medium	3.098e-01
## in.geometry_wall_exterior_finishStucco, Light	2.023e-01

## in.geometry_wall_exterior_finishVinyl, Light	1.833e-01
## in.geometry_wall_exterior_finishWood, Medium/Dark	1.841e-01
## in.geometry_wall_typeConcrete	2.075e-01
## in.geometry_wall_typeSteel Frame	2.916e-01
## in.geometry_wall_typeWood Frame	2.013e-01
## in.has_pvYes	1.018e+00
## in.heating_fuelFuel Oil	9.512e-01
## in.heating_fuelNatural Gas	3.281e-01
## in.heating_fuelNone	6.286e-01
## in.heating_fuelOther Fuel	4.099e-01
## in.heating_fuelPropane	3.480e-01
## in.heating_setpoint	3.444e-03
## in.heating_setpoint_has_offsetYes	1.553e-01
## in.heating_setpoint_offset_magnitude	5.370e-03
## in.heating_setpoint_offset_periodDay -1h	2.124e-01
## in.heating_setpoint_offset_periodDay -2h	2.161e-01
## in.heating_setpoint_offset_periodDay -3h	2.250e-01
## in.heating_setpoint_offset_periodDay -4h	2.095e-01
## in.heating_setpoint_offset_periodDay -5h	2.033e-01
## in.heating_setpoint_offset_periodDay +1h	2.172e-01
## in.heating_setpoint_offset_periodDay +2h	2.224e-01
## in.heating_setpoint_offset_periodDay +3h	2.119e-01
## in.heating_setpoint_offset_periodDay +4h	2.262e-01
## in.heating_setpoint_offset_periodDay +5h	2.301e-01
## in.heating_setpoint_offset_periodDay and Night	1.881e-01
## in.heating_setpoint_offset_periodDay and Night -1h	1.924e-01
## in.heating_setpoint_offset_periodDay and Night -2h	1.924e-01
## in.heating_setpoint_offset_periodDay and Night -3h	1.901e-01
## in.heating_setpoint_offset_periodDay and Night -4h	1.947e-01
## in.heating_setpoint_offset_periodDay and Night -5h	1.933e-01
## in.heating_setpoint_offset_periodDay and Night +1h	1.949e-01
## in.heating_setpoint_offset_periodDay and Night +2h	1.917e-01
## in.heating_setpoint_offset_periodDay and Night +3h	1.914e-01
## in.heating_setpoint_offset_periodDay and Night +4h	1.932e-01
## in.heating_setpoint_offset_periodDay and Night +5h	1.991e-01
## in.heating_setpoint_offset_periodNight	1.707e-01
## in.heating_setpoint_offset_periodNight -1h	1.710e-01
## in.heating_setpoint_offset_periodNight -2h	1.701e-01
## in.heating_setpoint_offset_periodNight -3h	1.713e-01
## in.heating_setpoint_offset_periodNight -4h	1.680e-01
## in.heating_setpoint_offset_periodNight -5h	1.766e-01
## in.heating_setpoint_offset_periodNight +1h	1.711e-01
## in.heating_setpoint_offset_periodNight +2h	1.711e-01
## in.heating_setpoint_offset_periodNight +3h	1.700e-01
## in.heating_setpoint_offset_periodNight +4h	1.735e-01
## in.heating_setpoint_offset_periodNight +5h	1.712e-01
## in.heating_setpoint_offset_periodNone	NA
## in.hot_water_fixtures200% Usage	3.562e-01
## in.hot_water_fixtures50% Usage	3.548e-01
## in.hvac_cooling_efficiencyAC, SEER 13	4.318e-02
## in.hvac_cooling_efficiencyAC, SEER 15	4.936e-02
## in.hvac_cooling_efficiencyAC, SEER 8	1.075e-01
## in.hvac_cooling_efficiencyHeat Pump	3.439e-01
## in.hvac_cooling_efficiencyNone	1.050e-01
## in.hvac_cooling_efficiencyRoom AC, EER 10.7	1.207e-01
## in.hvac_cooling_efficiencyRoom AC, EER 12.0	1.429e-01

## in.hvac_cooling_efficiencyRoom AC, EER 8.5	1.904e-01
## in.hvac_cooling_efficiencyRoom AC, EER 9.8	1.269e-01
## in.hvac_cooling_partial_space_conditioning20% Conditioned	1.126e-01
## in.hvac_cooling_partial_space_conditioning40% Conditioned	1.223e-01
## in.hvac_cooling_partial_space_conditioning60% Conditioned	8.602e-02
## in.hvac_cooling_partial_space_conditioning80% Conditioned	8.028e-02
## in.hvac_cooling_partial_space_conditioningNone	NA
## in.hvac_cooling_typeHeat Pump	NA
## in.hvac_cooling_typeNone	NA
## in.hvac_cooling_typeRoom AC	NA
## in.hvac_has_ductsYes	NA
## in.hvac_has_zonal_electric_heatingYes	3.199e-01
## in.hvac_heating_efficiencyASHP, SEER 13, 7.7 HSPF	1.160e-01
## in.hvac_heating_efficiencyASHP, SEER 15, 8.5 HSPF	1.282e-01
## in.hvac_heating_efficiencyElectric Baseboard, 100% Efficiency	NA
## in.hvac_heating_efficiencyElectric Boiler, 100% AFUE	5.386e-01
## in.hvac_heating_efficiencyElectric Furnace, 100% AFUE	4.348e-01
## in.hvac_heating_efficiencyElectric Wall Furnace, 100% AFUE	NA
## in.hvac_heating_efficiencyFuel Boiler, 76% AFUE	4.936e-01
## in.hvac_heating_efficiencyFuel Boiler, 80% AFUE	4.707e-01
## in.hvac_heating_efficiencyFuel Boiler, 90% AFUE	4.817e-01
## in.hvac_heating_efficiencyFuel Furnace, 60% AFUE	4.074e-01
## in.hvac_heating_efficiencyFuel Furnace, 76% AFUE	3.473e-01
## in.hvac_heating_efficiencyFuel Furnace, 80% AFUE	3.381e-01
## in.hvac_heating_efficiencyFuel Furnace, 92.5% AFUE	3.401e-01
## in.hvac_heating_efficiencyFuel Wall/Floor Furnace, 60% AFUE	1.356e-01
## in.hvac_heating_efficiencyFuel Wall/Floor Furnace, 68% AFUE	NA
## in.hvac_heating_efficiencyNone	NA
## in.hvac_heating_efficiencyOther	NA
## in.hvac_heating_typeDucted Heating	3.078e-01
## in.hvac_heating_typeNon-Ducted Heating	NA
## in.hvac_heating_typeNone	NA
## in.hvac_heating_type_and_fuelElectricity Baseboard	NA
## in.hvac_heating_type_and_fuelElectricity Electric Boiler	NA
## in.hvac_heating_type_and_fuelElectricity Electric Furnace	NA
## in.hvac_heating_type_and_fuelElectricity Electric Wall Furnace	NA
## in.hvac_heating_type_and_fuelFuel Oil Fuel Boiler	1.068e+00
## in.hvac_heating_type_and_fuelFuel Oil Fuel Furnace	9.287e-01
## in.hvac_heating_type_and_fuelFuel Oil Fuel Wall/Floor Furnace	NA
## in.hvac_heating_type_and_fuelNatural Gas Fuel Boiler	4.793e-01
## in.hvac_heating_type_and_fuelNatural Gas Fuel Furnace	1.719e-01
## in.hvac_heating_type_and_fuelNatural Gas Fuel Wall/Floor Furnace	NA
## in.hvac_heating_type_and_fuelNone	NA
## in.hvac_heating_type_and_fuelPropane Fuel Boiler	NA
## in.hvac_heating_type_and_fuelPropane Fuel Furnace	NA
## in.hvac_heating_type_and_fuelPropane Fuel Wall/Floor Furnace	NA
## in.income	9.827e-07
## in.income_recs_2015	2.120e-06
## in.income_recs_2020	1.762e-06
## in.infiltration	1.925e-03
## in.insulation_ceilingR-13	7.291e-02
## in.insulation_ceilingR-19	7.309e-02
## in.insulation_ceilingR-30	7.080e-02
## in.insulation_ceilingR-38	7.926e-02
## in.insulation_ceilingR-49	1.966e-01
## in.insulation_ceilingR-7	7.980e-02

## in.insulation_ceilingUninsulated	NA
## in.insulation_floorCeiling R-19	6.921e-02
## in.insulation_floorNone	NA
## in.insulation_floorUninsulated	6.536e-02
## in.insulation.foundation_wallUninsulated	3.216e-01
## in.insulation.foundation_wallWall R-10, Exterior	3.593e-01
## in.insulation.foundation_wallWall R-15, Exterior	4.255e-01
## in.insulation.foundation_wallWall R-5, Exterior	NA
## in.insulation_rim_joistR-10, Exterior	NA
## in.insulation_rim_joistR-15, Exterior	NA
## in.insulation_rim_joistR-5, Exterior	NA
## in.insulation_rim_joistUninsulated	NA
## in.insulation_roofFinished, R-19	3.790e-01
## in.insulation_roofFinished, R-30	3.336e-01
## in.insulation_roofFinished, R-38	3.635e-01
## in.insulation_roofFinished, R-49	5.204e-01
## in.insulation_roofFinished, R-7	5.369e-01
## in.insulation_roofFinished, Uninsulated	1.102e+00
## in.insulation_roofUnfinished, Uninsulated	NA
## in.insulation_slab2ft R10 Under, Horizontal	1.165e-01
## in.insulation_slab2ft R5 Perimeter, Vertical	1.358e-01
## in.insulation_slab2ft R5 Under, Horizontal	1.278e-01
## in.insulation_slabNone	NA
## in.insulation_slabUninsulated	1.016e-01
## in.insulation_wallBrick, 12-in, 3-wythe, R-15	1.265e-01
## in.insulation_wallBrick, 12-in, 3-wythe, R-19	1.171e-01
## in.insulation_wallBrick, 12-in, 3-wythe, R-7	2.012e-01
## in.insulation_wallBrick, 12-in, 3-wythe, Uninsulated	1.825e-01
## in.insulation_wallCMU, 6-in Hollow, R-11	2.224e-01
## in.insulation_wallCMU, 6-in Hollow, R-15	3.007e-01
## in.insulation_wallCMU, 6-in Hollow, R-19	2.790e-01
## in.insulation_wallCMU, 6-in Hollow, R-7	2.535e-01
## in.insulation_wallCMU, 6-in Hollow, Uninsulated	NA
## in.insulation_wallWood Stud, R-11	1.730e-01
## in.insulation_wallWood Stud, R-15	1.810e-01
## in.insulation_wallWood Stud, R-19	1.805e-01
## in.insulation_wallWood Stud, R-7	7.531e-02
## in.insulation_wallWood Stud, Uninsulated	NA
## in.lighting100% Incandescent	2.926e-02
## in.lighting100% LED	3.270e-02
## in.misc_extra_refrigeratorEF 10.5	1.766e-01
## in.misc_extra_refrigeratorEF 15.9	1.664e-01
## in.misc_extra_refrigeratorEF 17.6	1.633e-01
## in.misc_extra_refrigeratorEF 19.9	1.879e-01
## in.misc_extra_refrigeratorEF 6.7	1.754e-01
## in.misc_extra_refrigeratorNone	1.609e-01
## in.misc_freezerNone	2.602e-02
## in.misc_gas_fireplaceNone	7.030e-02
## in.misc_gas_grillNone	7.400e-02
## in.misc_gas_lightingNone	1.052e-01
## in.misc_hot_tub_spaGas	1.069e-01
## in.misc_hot_tub_spaNone	5.958e-02
## in.misc_poolNone	4.438e-02
## in.misc_pool_heaterGas	1.662e-01
## in.misc_pool_heaterNone	1.241e-01
## in.misc_pool_heaterSolar	3.366e-01

## in.misc_pool_pumpNone	NA
## in.misc_well_pumpTypical_Efficiency	3.775e-02
## in.occupants10+	3.419e-01
## in.occupants2	3.596e-02
## in.occupants3	4.573e-02
## in.occupants4	5.101e-02
## in.occupants5	6.686e-02
## in.occupants6	9.896e-02
## in.occupants7	1.353e-01
## in.occupants8	2.094e-01
## in.occupants9	3.599e-01
## in.orientationNorth	4.224e-02
## in.orientationNortheast	5.664e-02
## in.orientationNorthwest	5.404e-02
## in.orientationSouth	4.253e-02
## in.orientationSoutheast	5.556e-02
## in.orientationSouthwest	5.588e-02
## in.orientationWest	4.344e-02
## in.plug_load_diversity200%	NA
## in.plug_load_diversity50%	NA
## in.pumaG45000102	NA
## in.pumaG45000103	NA
## in.pumaG45000104	NA
## in.pumaG45000105	NA
## in.pumaG45000200	NA
## in.pumaG45000301	NA
## in.pumaG45000302	NA
## in.pumaG45000400	NA
## in.pumaG45000501	NA
## in.pumaG45000502	NA
## in.pumaG45000601	NA
## in.pumaG45000602	NA
## in.pumaG45000603	NA
## in.pumaG45000604	NA
## in.pumaG45000605	NA
## in.pumaG45000700	NA
## in.pumaG45000800	NA
## in.pumaG45000900	NA
## in.pumaG45001000	NA
## in.pumaG45001101	NA
## in.pumaG45001102	NA
## in.pumaG45001201	NA
## in.pumaG45001202	NA
## in.pumaG45001203	NA
## in.pumaG45001204	NA
## in.pumaG45001300	NA
## in.pumaG45001400	NA
## in.pumaG45001500	NA
## in.pumaG45001600	NA
## in.puma_metro_statusNot/partially in metro area	NA
## in.pv_orientationNone	NA
## in.pv_orientationNorth	1.435e+00
## in.pv_orientationSouth	3.751e-01
## in.pv_orientationSoutheast	4.572e-01
## in.pv_orientationSouthwest	5.561e-01
## in.pv_orientationWest	6.601e-01

## in.pv_system_size11.0 kWDC	1.063e+00
## in.pv_system_size13.0 kWDC	1.218e+00
## in.pv_system_size3.0 kWDC	1.040e+00
## in.pv_system_size5.0 kWDC	1.003e+00
## in.pv_system_size7.0 kWDC	1.021e+00
## in.pv_system_size9.0 kWDC	1.018e+00
## in.pv_system_sizeNone	NA
## in.range_spot_vent_hour	2.615e-03
## in.reeds_balancing_area	NA
## in.refrigeratorEF 10.5, 100% Usage	1.936e-01
## in.refrigeratorEF 15.9, 100% Usage	1.849e-01
## in.refrigeratorEF 17.6, 100% Usage	1.831e-01
## in.refrigeratorEF 19.9, 100% Usage	1.855e-01
## in.refrigeratorEF 6.7, 100% Usage	1.980e-01
## in.refrigeratorNone	3.287e-01
## in.roof_materialComposition Shingles	3.861e-02
## in.roof_materialMetal, Dark	5.759e-02
## in.roof_materialSlate	1.344e-01
## in.roof_materialTile, Clay or Ceramic	8.933e-02
## in.roof_materialTile, Concrete	1.464e-01
## in.roof_materialWood Shingles	5.646e-02
## in.tenureRenter	3.723e-02
## in.usage_levelLow	NA
## in.usage_levelMedium	NA
## in.vacancy_statusVacant	9.234e-02
## in.vintage1940s	8.523e-02
## in.vintage1950s	7.141e-02
## in.vintage1960s	7.394e-02
## in.vintage1970s	7.946e-02
## in.vintage1980s	1.824e-01
## in.vintage1990s	1.917e-01
## in.vintage2000s	2.427e-01
## in.vintage2010s	2.463e-01
## in.vintage_acs1940-59	NA
## in.vintage_acs1960-79	NA
## in.vintage_acs1980-99	NA
## in.vintage_acs2000-09	NA
## in.vintage_acs2010s	NA
## in.water_heater_efficiencyElectric Premium	2.440e-01
## in.water_heater_efficiencyElectric Standard	2.395e-01
## in.water_heater_efficiencyElectric Tankless	2.842e-01
## in.water_heater_efficiencyFuel Oil Standard	6.201e-01
## in.water_heater_efficiencyNatural Gas Premium	2.524e-01
## in.water_heater_efficiencyNatural Gas Standard	2.420e-01
## in.water_heater_efficiencyNatural Gas Tankless	3.091e-01
## in.water_heater_efficiencyOther Fuel	3.114e-01
## in.water_heater_efficiencyPropane Premium	3.536e-01
## in.water_heater_efficiencyPropane Standard	2.539e-01
## in.water_heater_efficiencyPropane Tankless	3.375e-01
## in.water_heater_fuelFuel Oil	NA
## in.water_heater_fuelNatural Gas	NA
## in.water_heater_fuelOther Fuel	NA
## in.water_heater_fuelPropane	NA
## in.weather_file_cityAugusta Bush Field	NA
## in.weather_file_cityBeaufort Mcas	NA
## in.weather_file_cityCharleston Muni	NA

## in.weather_file_cityColumbia Metro	NA
## in.weather_file_cityColumbia Owens Apt	NA
## in.weather_file_cityDaniel Field	NA
## in.weather_file_cityFlorence Rgnl	NA
## in.weather_file_cityGreenville Greenvil	NA
## in.weather_file_cityGreenwood Co	NA
## in.weather_file_cityMaxton	NA
## in.weather_file_cityMonroe Airport	NA
## in.weather_file_cityMyrtle Beach Civ	NA
## in.weather_file_cityOconee Co Rgnl	NA
## in.weather_file_cityOrangeburg Muni	NA
## in.weather_file_cityRock Hill York Co	NA
## in.weather_file_cityRutherfordton	NA
## in.weather_file_cityShaw Afb Sumter	NA
## in.weather_file_latitude	NA
## in.weather_file_longitude	2.089e+08
## in.window_areasF15 B15 L15 R15	4.003e-02
## in.window_areasF18 B18 L18 R18	4.027e-02
## in.window_areasF30 B30 L30 R30	6.788e-02
## in.window_areasF6 B6 L6 R6	4.783e-02
## in.window_areasF9 B9 L9 R9	3.424e-02
## in.windowsDouble, Clear, Metal, Air, Exterior Clear Storm	1.133e-01
## in.windowsDouble, Clear, Non-metal, Air	4.235e-02
## in.windowsDouble, Clear, Non-metal, Air, Exterior Clear Storm	9.147e-02
## in.windowsDouble, Low-E, Non-metal, Air, M-Gain	4.144e-02
## in.windowsSingle, Clear, Metal	4.273e-02
## in.windowsSingle, Clear, Metal, Exterior Clear Storm	1.441e-01
## in.windowsSingle, Clear, Non-metal	4.542e-02
## in.windowsSingle, Clear, Non-metal, Exterior Clear Storm	1.114e-01
## in.windowsTriple, Low-E, Non-metal, Air, L-Gain	1.768e-01
## upgrade.insulation_roofFinished, R-30	NA
## upgrade.water_heater_efficiencyElectric Heat Pump, 50 gal, 3.45 UEF	9.348e-02
## upgrade.water_heater_efficiencyElectric Heat Pump, 66 gal, 3.35 UEF	6.458e-02
## upgrade.water_heater_efficiencyElectric Heat Pump, 80 gal, 3.45 UEF	NA
## upgrade.infiltration_reduction30%	3.835e-02
## upgrade.geometry.foundation_typeUnvented Crawlspace	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 100% Usage	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 120% Usage	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 80% Usage	NA
## upgrade.insulation_ceilingR-49	NA
## upgrade.ducts10% Leakage, R-8	NA
## upgrade.hvac_heating_typeDucted Heat Pump	NA
## upgrade.insulation_wallWood Stud, R-13	NA
## upgrade.insulation.foundation_wallWall R-10, Interior	3.996e-01
## upgrade.hvac_heating_efficiencyMSHP, SEER 29.3, 14 HSPF, Max Load	NA
## upgrade.cooking_rangeElectric, Induction, 100% Usage	NA
## upgrade.cooking_rangeElectric, Induction, 120% Usage	NA
## upgrade.cooking_rangeElectric, Induction, 80% Usage	NA
## county_idG4500030	NA
## county_idG4500050	NA
## county_idG4500070	NA
## county_idG4500090	NA
## county_idG4500110	NA
## county_idG4500130	NA
## county_idG4500150	NA
## county_idG4500170	NA

```
## county_idG4500190 NA
## county_idG4500210 NA
## county_idG4500230 NA
## county_idG4500250 NA
## county_idG4500270 NA
## county_idG4500290 NA
## county_idG4500310 NA
## county_idG4500330 NA
## county_idG4500350 NA
## county_idG4500370 NA
## county_idG4500390 NA
## county_idG4500410 NA
## county_idG4500430 NA
## county_idG4500450 NA
## county_idG4500470 NA
## county_idG4500490 NA
## county_idG4500510 NA
## county_idG4500530 NA
## county_idG4500550 NA
## county_idG4500570 NA
## county_idG4500590 NA
## county_idG4500610 NA
## county_idG4500630 NA
## county_idG4500650 NA
## county_idG4500670 NA
## county_idG4500690 NA
## county_idG4500710 NA
## county_idG4500730 NA
## county_idG4500750 NA
## county_idG4500770 NA
## county_idG4500790 NA
## county_idG4500810 NA
## county_idG4500830 NA
## county_idG4500850 NA
## county_idG4500870 NA
## county_idG4500890 NA
## county_idG4500910 NA
## date_time2018-07-02 NA
## date_time2018-07-03 NA
## date_time2018-07-04 NA
## date_time2018-07-05 NA
## date_time2018-07-06 NA
## date_time2018-07-07 NA
## date_time2018-07-08 NA
## date_time2018-07-09 NA
## date_time2018-07-10 NA
## date_time2018-07-11 NA
## date_time2018-07-12 NA
## date_time2018-07-13 NA
## date_time2018-07-14 NA
## date_time2018-07-15 NA
## date_time2018-07-16 NA
## date_time2018-07-17 NA
## date_time2018-07-18 NA
## date_time2018-07-19 NA
## date_time2018-07-20 NA
```

## date_time2018-07-21	NA
## date_time2018-07-22	NA
## date_time2018-07-23	NA
## date_time2018-07-24	NA
## date_time2018-07-25	NA
## date_time2018-07-26	NA
## date_time2018-07-27	NA
## date_time2018-07-28	NA
## date_time2018-07-29	NA
## date_time2018-07-30	NA
## date_time2018-07-31	NA
## Direct_Normal_Radiation	1.146e-03
## Diffuse_Horizontal_Radiation	1.548e-03
## Dry_Bulb_Temperature	2.525e-02
## Relative_Humidity	3.857e-03
## Wind_Speed	2.639e-02
## Wind_Direction	4.438e-04
## Global_Horizontal_Radiation	1.605e-03
##	t value
## (Intercept)	-0.487
## in.countyG4500030	0.487
## in.countyG4500050	0.487
## in.countyG4500070	-0.487
## in.countyG4500090	0.487
## in.countyG4500110	0.487
## in.countyG4500130	0.487
## in.countyG4500150	0.487
## in.countyG4500170	0.487
## in.countyG4500190	0.487
## in.countyG4500210	0.487
## in.countyG4500230	0.487
## in.countyG4500250	0.487
## in.countyG4500270	0.487
## in.countyG4500290	0.487
## in.countyG4500310	0.487
## in.countyG4500330	0.487
## in.countyG4500350	0.487
## in.countyG4500370	0.487
## in.countyG4500390	0.487
## in.countyG4500410	0.487
## in.countyG4500430	0.487
## in.countyG4500450	-0.487
## in.countyG4500470	3.425
## in.countyG4500490	0.487
## in.countyG4500510	0.487
## in.countyG4500530	0.487
## in.countyG4500550	0.487
## in.countyG4500570	0.487
## in.countyG4500590	2.473
## in.countyG4500610	0.487
## in.countyG4500630	0.487
## in.countyG4500650	1.731
## in.countyG4500670	0.487
## in.countyG4500690	0.487
## in.countyG4500710	0.487
## in.countyG4500730	-0.487

## in.countyG4500750	0.487
## in.countyG4500770	-0.487
## in.countyG4500790	0.487
## in.countyG4500810	-2.093
## in.countyG4500830	-0.487
## in.countyG4500850	0.487
## in.countyG4500870	-0.487
## in.countyG4500890	0.487
## in.countyG4500910	0.487
## date2018-07-02	50.446
## date2018-07-03	53.870
## date2018-07-04	45.339
## date2018-07-05	48.131
## date2018-07-06	49.721
## date2018-07-07	40.507
## date2018-07-08	20.925
## date2018-07-09	24.817
## date2018-07-10	28.839
## date2018-07-11	38.267
## date2018-07-12	49.813
## date2018-07-13	39.239
## date2018-07-14	43.924
## date2018-07-15	44.861
## date2018-07-16	38.845
## date2018-07-17	31.688
## date2018-07-18	37.945
## date2018-07-19	34.895
## date2018-07-20	32.306
## date2018-07-21	31.602
## date2018-07-22	41.261
## date2018-07-23	39.400
## date2018-07-24	32.958
## date2018-07-25	41.376
## date2018-07-26	38.906
## date2018-07-27	39.722
## date2018-07-28	48.180
## date2018-07-29	49.167
## date2018-07-30	36.005
## date2018-07-31	32.451
## bldg_id	-1.395
## in.sqft	28.669
## in.bathroom_spot_vent_hour	8.340
## in.bedrooms	2.407
## in.building_americana_climate_zoneMixed-Humid	NA
## in.ceiling_fanStandard Efficiency	10.084
## in.ceiling_fanStandard Efficiency, No usage	9.478
## in.cityNot in a census Place	5.084
## in.citySC, Charleston	5.243
## in.citySC, Columbia	-3.458
## in.citySC, Florence	1.042
## in.citySC, Goose Creek	-3.531
## in.citySC, Greenville	-3.072
## in.citySC, Hilton Head Island	-0.408
## in.citySC, Mount Pleasant	-3.306
## in.citySC, Myrtle Beach	1.023
## in.citySC, North Charleston	3.444

## in.citySC, North Myrtle Beach	2.039
## in.citySC, Rock Hill	-1.363
## in.citySC, Spartanburg	-1.575
## in.citySC, Summerville	-5.066
## in.citySC, Sumter	1.166
## in.clothes_dryerElectric, 120% Usage	-0.091
## in.clothes_dryerElectric, 80% Usage	4.169
## in.clothes_dryerGas, 100% Usage	-1.749
## in.clothes_dryerGas, 120% Usage	-1.893
## in.clothes_dryerGas, 80% Usage	4.566
## in.clothes_dryerNone	0.156
## in.clothes_dryerPropane, 100% Usage	-4.440
## in.clothes_dryerPropane, 120% Usage	-0.069
## in.clothes_dryerPropane, 80% Usage	3.075
## in.clothes_washerEnergyStar, 120% Usage	2.223
## in.clothes_washerEnergyStar, 80% Usage	-3.851
## in.clothes_washerNone	-1.837
## in.clothes_washerStandard, 100% Usage	16.725
## in.clothes_washerStandard, 120% Usage	5.260
## in.clothes_washerStandard, 80% Usage	-3.617
## in.clothes_washer_presenceYes	NA
## in.cooking_rangeElectric, 120% Usage	-7.441
## in.cooking_rangeElectric, 80% Usage	-0.959
## in.cooking_rangeGas, 100% Usage	0.719
## in.cooking_rangeGas, 120% Usage	-5.547
## in.cooking_rangeGas, 80% Usage	-2.602
## in.cooking_rangeNone	-12.628
## in.cooking_rangePropane, 100% Usage	3.370
## in.cooking_rangePropane, 120% Usage	-2.079
## in.cooking_rangePropane, 80% Usage	-1.473
## in.cooling_setpoint	-237.812
## in.cooling_setpoint_has_offsetYes	-6.359
## in.cooling_setpoint_offset_magnitude	33.970
## in.cooling_setpoint_offset_periodDay and Night Setup -1h	0.793
## in.cooling_setpoint_offset_periodDay and Night Setup -2h	-2.795
## in.cooling_setpoint_offset_periodDay and Night Setup -3h	-3.826
## in.cooling_setpoint_offset_periodDay and Night Setup -4h	-0.380
## in.cooling_setpoint_offset_periodDay and Night Setup -5h	4.286
## in.cooling_setpoint_offset_periodDay and Night Setup +1h	-2.370
## in.cooling_setpoint_offset_periodDay and Night Setup +2h	-4.250
## in.cooling_setpoint_offset_periodDay and Night Setup +3h	0.759
## in.cooling_setpoint_offset_periodDay and Night Setup +4h	-5.983
## in.cooling_setpoint_offset_periodDay and Night Setup +5h	-5.803
## in.cooling_setpoint_offset_periodDay Setup	0.265
## in.cooling_setpoint_offset_periodDay Setup -1h	-0.359
## in.cooling_setpoint_offset_periodDay Setup -2h	-1.461
## in.cooling_setpoint_offset_periodDay Setup -3h	1.334
## in.cooling_setpoint_offset_periodDay Setup -4h	3.832
## in.cooling_setpoint_offset_periodDay Setup -5h	-0.735
## in.cooling_setpoint_offset_periodDay Setup +1h	1.358
## in.cooling_setpoint_offset_periodDay Setup +2h	-3.234
## in.cooling_setpoint_offset_periodDay Setup +3h	-4.872
## in.cooling_setpoint_offset_periodDay Setup +4h	-0.897
## in.cooling_setpoint_offset_periodDay Setup +5h	-6.218
## in.cooling_setpoint_offset_periodDay Setup and Night Setback	0.964
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -1h	5.311

## in.cooling_setpoint_offset_periodDay Setup and Night Setback -2h	11.764
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -3h	12.654
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -4h	13.065
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -5h	15.753
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +1h	1.665
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +2h	9.277
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +3h	-2.329
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +4h	4.080
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +5h	2.548
## in.cooling_setpoint_offset_periodNight Setback	4.783
## in.cooling_setpoint_offset_periodNight Setback -1h	3.689
## in.cooling_setpoint_offset_periodNight Setback -2h	3.994
## in.cooling_setpoint_offset_periodNight Setback -3h	8.308
## in.cooling_setpoint_offset_periodNight Setback -4h	10.668
## in.cooling_setpoint_offset_periodNight Setback -5h	8.096
## in.cooling_setpoint_offset_periodNight Setback +1h	4.187
## in.cooling_setpoint_offset_periodNight Setback +2h	4.609
## in.cooling_setpoint_offset_periodNight Setback +3h	6.494
## in.cooling_setpoint_offset_periodNight Setback +4h	-0.021
## in.cooling_setpoint_offset_periodNight Setback +5h	2.574
## in.cooling_setpoint_offset_periodNight Setup	-0.715
## in.cooling_setpoint_offset_periodNight Setup -1h	-1.169
## in.cooling_setpoint_offset_periodNight Setup -2h	-2.519
## in.cooling_setpoint_offset_periodNight Setup -3h	1.455
## in.cooling_setpoint_offset_periodNight Setup -4h	-0.823
## in.cooling_setpoint_offset_periodNight Setup -5h	-1.308
## in.cooling_setpoint_offset_periodNight Setup +1h	2.507
## in.cooling_setpoint_offset_periodNight Setup +2h	-1.394
## in.cooling_setpoint_offset_periodNight Setup +3h	2.162
## in.cooling_setpoint_offset_periodNight Setup +4h	0.635
## in.cooling_setpoint_offset_periodNight Setup +5h	0.959
## in.cooling_setpoint_offset_periodNone	NA
## in.county_and_pumaG4500030, G45001500	NA
## in.county_and_pumaG4500050, G45001300	NA
## in.county_and_pumaG4500070, G45000200	NA
## in.county_and_pumaG4500090, G45001300	NA
## in.county_and_pumaG4500110, G45001300	NA
## in.county_and_pumaG4500130, G45001400	NA
## in.county_and_pumaG4500150, G45001201	-8.270
## in.county_and_pumaG4500150, G45001202	1.354
## in.county_and_pumaG4500150, G45001203	-9.244
## in.county_and_pumaG4500150, G45001204	NA
## in.county_and_pumaG4500170, G45000605	NA
## in.county_and_pumaG4500190, G45001201	0.736
## in.county_and_pumaG4500190, G45001202	-0.779
## in.county_and_pumaG4500190, G45001203	2.550
## in.county_and_pumaG4500190, G45001204	NA
## in.county_and_pumaG4500210, G45000400	NA
## in.county_and_pumaG4500230, G45000400	NA
## in.county_and_pumaG4500250, G45000700	NA
## in.county_and_pumaG4500270, G45000800	NA
## in.county_and_pumaG4500290, G45001300	NA
## in.county_and_pumaG4500310, G45000900	NA
## in.county_and_pumaG4500330, G45001000	NA
## in.county_and_pumaG4500350, G45001201	0.861
## in.county_and_pumaG4500350, G45001204	NA

## in.county_and_pumaG4500370, G45001500	NA
## in.county_and_pumaG4500390, G45000603	NA
## in.county_and_pumaG4500410, G45000900	NA
## in.county_and_pumaG4500430, G45001000	NA
## in.county_and_pumaG4500450, G45000102	-1.024
## in.county_and_pumaG4500450, G45000103	5.341
## in.county_and_pumaG4500450, G45000104	4.954
## in.county_and_pumaG4500450, G45000105	NA
## in.county_and_pumaG4500470, G45001600	NA
## in.county_and_pumaG4500490, G45001300	NA
## in.county_and_pumaG4500510, G45001101	4.462
## in.county_and_pumaG4500510, G45001102	NA
## in.county_and_pumaG4500530, G45001400	NA
## in.county_and_pumaG4500550, G45000605	NA
## in.county_and_pumaG4500570, G45000700	NA
## in.county_and_pumaG4500590, G45000105	NA
## in.county_and_pumaG4500610, G45000800	NA
## in.county_and_pumaG4500630, G45000601	0.954
## in.county_and_pumaG4500630, G45000602	NA
## in.county_and_pumaG4500650, G45001600	NA
## in.county_and_pumaG4500670, G45001000	NA
## in.county_and_pumaG4500690, G45000700	NA
## in.county_and_pumaG4500710, G45000400	NA
## in.county_and_pumaG4500730, G45000101	NA
## in.county_and_pumaG4500750, G45001300	NA
## in.county_and_pumaG4500770, G45000101	NA
## in.county_and_pumaG4500790, G45000603	7.843
## in.county_and_pumaG4500790, G45000604	8.476
## in.county_and_pumaG4500790, G45000605	NA
## in.county_and_pumaG4500810, G45000601	NA
## in.county_and_pumaG4500830, G45000301	-1.109
## in.county_and_pumaG4500830, G45000302	NA
## in.county_and_pumaG4500850, G45000800	NA
## in.county_and_pumaG4500870, G45000400	NA
## in.county_and_pumaG4500890, G45000800	NA
## in.county_and_pumaG4500910, G45000501	-1.376
## in.county_and_pumaG4500910, G45000502	NA
## in.dishwasher290 Rated kWh, 120% Usage	-1.154
## in.dishwasher290 Rated kWh, 80% Usage	-2.025
## in.dishwasher318 Rated kWh, 100% Usage	-1.395
## in.dishwasher318 Rated kWh, 120% Usage	4.308
## in.dishwasher318 Rated kWh, 80% Usage	2.095
## in.dishwasherNone	-9.179
## in.ducts10% Leakage, R-4	5.206
## in.ducts10% Leakage, R-6	5.431
## in.ducts10% Leakage, R-8	8.574
## in.ducts10% Leakage, Uninsulated	2.652
## in.ducts20% Leakage, R-4	5.331
## in.ducts20% Leakage, R-6	7.428
## in.ducts20% Leakage, R-8	7.647
## in.ducts20% Leakage, Uninsulated	2.980
## in.ducts30% Leakage, R-4	4.495
## in.ducts30% Leakage, R-6	6.897
## in.ducts30% Leakage, R-8	7.541
## in.ducts30% Leakage, Uninsulated	5.903
## in.ductsNone	-2.359

## in.federal_poverty_level100-150%	4.465
## in.federal_poverty_level150-200%	0.923
## in.federal_poverty_level200-300%	5.132
## in.federal_poverty_level300-400%	-0.514
## in.federal_poverty_level400%+	3.551
## in.geometry_attic_typeVented Attic	7.045
## in.geometry_floor_area1000-1499	-9.674
## in.geometry_floor_area1500-1999	-10.526
## in.geometry_floor_area2000-2499	-11.656
## in.geometry_floor_area2500-2999	-12.077
## in.geometry_floor_area3000-3999	-12.396
## in.geometry_floor_area4000+	-15.148
## in.geometry_floor_area500-749	0.370
## in.geometry_floor_area750-999	NA
## in.geometry_floor_area_bin1500-2499	NA
## in.geometry_floor_area_bin2500-3999	NA
## in.geometry_floor_area_bin4000+	NA
## in.geometry.foundation_typeHeated Basement	3.744
## in.geometry.foundation_typeSlab	18.396
## in.geometry.foundation_typeUnheated Basement	3.580
## in.geometry.foundation_typeUnvented Crawlspace	2.294
## in.geometry.foundation_typeVented Crawlspace	3.010
## in.geometry_garage	-18.612
## in.geometry_stories	17.240
## in.geometry_stories_low_rise	NA
## in.geometry_wall_exterior_finishBrick, Light	-2.014
## in.geometry_wall_exterior_finishBrick, Medium/Dark	2.108
## in.geometry_wall_exterior_finishFiber-Cement, Light	-1.709
## in.geometry_wall_exterior_finishNone	0.179
## in.geometry_wall_exterior_finishShingle, Asbestos, Medium	2.725
## in.geometry_wall_exterior_finishShingle, Composition, Medium	0.654
## in.geometry_wall_exterior_finishStucco, Light	-2.214
## in.geometry_wall_exterior_finishVinyl, Light	-1.094
## in.geometry_wall_exterior_finishWood, Medium/Dark	1.504
## in.geometry_wall_typeConcrete	8.167
## in.geometry_wall_typeSteel Frame	1.291
## in.geometry_wall_typeWood Frame	2.225
## in.has_pvYes	3.051
## in.heating_fuelFuel Oil	0.542
## in.heating_fuelNatural Gas	0.504
## in.heating_fuelNone	-0.863
## in.heating_fuelOther Fuel	0.192
## in.heating_fuelPropane	1.445
## in.heating_setpoint	-49.158
## in.heating_setpoint_has_offsetYes	-2.394
## in.heating_setpoint_offset_magnitude	10.603
## in.heating_setpoint_offset_periodDay -1h	-1.309
## in.heating_setpoint_offset_periodDay -2h	1.331
## in.heating_setpoint_offset_periodDay -3h	1.019
## in.heating_setpoint_offset_periodDay -4h	-5.197
## in.heating_setpoint_offset_periodDay -5h	1.822
## in.heating_setpoint_offset_periodDay +1h	-4.287
## in.heating_setpoint_offset_periodDay +2h	0.881
## in.heating_setpoint_offset_periodDay +3h	1.405
## in.heating_setpoint_offset_periodDay +4h	-0.669
## in.heating_setpoint_offset_periodDay +5h	5.505

## in.heating_setpoint_offset_periodDay and Night	6.342
## in.heating_setpoint_offset_periodDay and Night -1h	1.610
## in.heating_setpoint_offset_periodDay and Night -2h	-1.296
## in.heating_setpoint_offset_periodDay and Night -3h	0.722
## in.heating_setpoint_offset_periodDay and Night -4h	1.481
## in.heating_setpoint_offset_periodDay and Night -5h	1.768
## in.heating_setpoint_offset_periodDay and Night +1h	3.937
## in.heating_setpoint_offset_periodDay and Night +2h	0.836
## in.heating_setpoint_offset_periodDay and Night +3h	6.061
## in.heating_setpoint_offset_periodDay and Night +4h	-1.810
## in.heating_setpoint_offset_periodDay and Night +5h	3.414
## in.heating_setpoint_offset_periodNight	0.070
## in.heating_setpoint_offset_periodNight -1h	5.960
## in.heating_setpoint_offset_periodNight -2h	-1.837
## in.heating_setpoint_offset_periodNight -3h	4.557
## in.heating_setpoint_offset_periodNight -4h	3.023
## in.heating_setpoint_offset_periodNight -5h	-0.501
## in.heating_setpoint_offset_periodNight +1h	-0.047
## in.heating_setpoint_offset_periodNight +2h	2.715
## in.heating_setpoint_offset_periodNight +3h	-1.473
## in.heating_setpoint_offset_periodNight +4h	2.360
## in.heating_setpoint_offset_periodNight +5h	2.155
## in.heating_setpoint_offset_periodNone	NA
## in.hot_water_fixtures200% Usage	25.256
## in.hot_water_fixtures50% Usage	-8.683
## in.hvac_cooling_efficiencyAC, SEER 13	-0.028
## in.hvac_cooling_efficiencyAC, SEER 15	-1.775
## in.hvac_cooling_efficiencyAC, SEER 8	0.670
## in.hvac_cooling_efficiencyHeat Pump	-2.323
## in.hvac_cooling_efficiencyNone	-5.793
## in.hvac_cooling_efficiencyRoom AC, EER 10.7	-0.484
## in.hvac_cooling_efficiencyRoom AC, EER 12.0	2.437
## in.hvac_cooling_efficiencyRoom AC, EER 8.5	3.494
## in.hvac_cooling_efficiencyRoom AC, EER 9.8	-1.224
## in.hvac_cooling_partial_space_conditioning20% Conditioned	-2.924
## in.hvac_cooling_partial_space_conditioning40% Conditioned	-6.004
## in.hvac_cooling_partial_space_conditioning60% Conditioned	-0.608
## in.hvac_cooling_partial_space_conditioning80% Conditioned	-3.127
## in.hvac_cooling_partial_space_conditioningNone	NA
## in.hvac_cooling_typeHeat Pump	NA
## in.hvac_cooling_typeNone	NA
## in.hvac_cooling_typeRoom AC	NA
## in.hvac_has_ductsYes	NA
## in.hvac_has_zonal_electric_heatingYes	-0.613
## in.hvac_heating_efficiencyASHP, SEER 13, 7.7 HSPF	4.611
## in.hvac_heating_efficiencyASHP, SEER 15, 8.5 HSPF	3.615
## in.hvac_heating_efficiencyElectric Baseboard, 100% Efficiency	NA
## in.hvac_heating_efficiencyElectric Boiler, 100% AFUE	-4.970
## in.hvac_heating_efficiencyElectric Furnace, 100% AFUE	0.828
## in.hvac_heating_efficiencyElectric Wall Furnace, 100% AFUE	NA
## in.hvac_heating_efficiencyFuel Boiler, 76% AFUE	-4.410
## in.hvac_heating_efficiencyFuel Boiler, 80% AFUE	-4.979
## in.hvac_heating_efficiencyFuel Boiler, 90% AFUE	-2.167
## in.hvac_heating_efficiencyFuel Furnace, 60% AFUE	-2.906
## in.hvac_heating_efficiencyFuel Furnace, 76% AFUE	-0.514
## in.hvac_heating_efficiencyFuel Furnace, 80% AFUE	-0.914

## in.hvac_heating_efficiencyFuel Furnace, 92.5% AFUE	-1.559
## in.hvac_heating_efficiencyFuel Wall/Floor Furnace, 60% AFUE	-2.614
## in.hvac_heating_efficiencyFuel Wall/Floor Furnace, 68% AFUE	NA
## in.hvac_heating_efficiencyNone	NA
## in.hvac_heating_efficiencyOther	NA
## in.hvac_heating_typeDucted Heating	-2.269
## in.hvac_heating_typeNon-Ducted Heating	NA
## in.hvac_heating_typeNone	NA
## in.hvac_heating_type_and_fuelElectricity Baseboard	NA
## in.hvac_heating_type_and_fuelElectricity Electric Boiler	NA
## in.hvac_heating_type_and_fuelElectricity Electric Furnace	NA
## in.hvac_heating_type_and_fuelElectricity Electric Wall Furnace	NA
## in.hvac_heating_type_and_fuelFuel Oil Fuel Boiler	0.794
## in.hvac_heating_type_and_fuelFuel Oil Fuel Furnace	-0.687
## in.hvac_heating_type_and_fuelFuel Oil Fuel Wall/Floor Furnace	NA
## in.hvac_heating_type_and_fuelNatural Gas Fuel Boiler	4.103
## in.hvac_heating_type_and_fuelNatural Gas Fuel Furnace	3.657
## in.hvac_heating_type_and_fuelNatural Gas Fuel Wall/Floor Furnace	NA
## in.hvac_heating_type_and_fuelNone	NA
## in.hvac_heating_type_and_fuelPropane Fuel Boiler	NA
## in.hvac_heating_type_and_fuelPropane Fuel Furnace	NA
## in.hvac_heating_type_and_fuelPropane Fuel Wall/Floor Furnace	NA
## in.income	-4.157
## in.income_recs_2015	4.537
## in.income_recs_2020	-2.693
## in.infiltration	22.888
## in.insulation_ceilingR-13	-0.255
## in.insulation_ceilingR-19	-3.059
## in.insulation_ceilingR-30	-0.170
## in.insulation_ceilingR-38	1.215
## in.insulation_ceilingR-49	-6.130
## in.insulation_ceilingR-7	3.481
## in.insulation_ceilingUninsulated	NA
## in.insulation_floorCeiling R-19	2.108
## in.insulation_floorNone	NA
## in.insulation_floorUninsulated	14.159
## in.insulation.foundation_wallUninsulated	7.552
## in.insulation.foundation_wallWall R-10, Exterior	-2.224
## in.insulation.foundation_wallWall R-15, Exterior	0.008
## in.insulation.foundation_wallWall R-5, Exterior	NA
## in.insulation_rim_joistR-10, Exterior	NA
## in.insulation_rim_joistR-15, Exterior	NA
## in.insulation_rim_joistR-5, Exterior	NA
## in.insulation_rim_joistUninsulated	NA
## in.insulation_roofFinished, R-19	-0.177
## in.insulation_roofFinished, R-30	-5.033
## in.insulation_roofFinished, R-38	-1.043
## in.insulation_roofFinished, R-49	-0.227
## in.insulation_roofFinished, R-7	3.092
## in.insulation_roofFinished, Uninsulated	-2.358
## in.insulation_roofUnfinished, Uninsulated	NA
## in.insulation_slab2ft R10 Under, Horizontal	1.623
## in.insulation_slab2ft R5 Perimeter, Vertical	-0.218
## in.insulation_slab2ft R5 Under, Horizontal	3.202
## in.insulation_slabNone	NA
## in.insulation_slabUninsulated	3.612

## in.insulation_wallBrick, 12-in, 3-wythe, R-15	-5.408
## in.insulation_wallBrick, 12-in, 3-wythe, R-19	1.144
## in.insulation_wallBrick, 12-in, 3-wythe, R-7	4.334
## in.insulation_wallBrick, 12-in, 3-wythe, Uninsulated	10.099
## in.insulation_wallCMU, 6-in Hollow, R-11	-7.740
## in.insulation_wallCMU, 6-in Hollow, R-15	-10.090
## in.insulation_wallCMU, 6-in Hollow, R-19	-6.685
## in.insulation_wallCMU, 6-in Hollow, R-7	0.583
## in.insulation_wallCMU, 6-in Hollow, Uninsulated	NA
## in.insulation_wallWood Stud, R-11	-1.438
## in.insulation_wallWood Stud, R-15	-0.299
## in.insulation_wallWood Stud, R-19	-2.848
## in.insulation_wallWood Stud, R-7	6.968
## in.insulation_wallWood Stud, Uninsulated	NA
## in.lighting100% Incandescent	137.047
## in.lighting100% LED	-12.617
## in.misc_extra_refrigeratorEF 10.5	-2.153
## in.misc_extra_refrigeratorEF 15.9	-4.937
## in.misc_extra_refrigeratorEF 17.6	-5.638
## in.misc_extra_refrigeratorEF 19.9	-3.161
## in.misc_extra_refrigeratorEF 6.7	10.130
## in.misc_extra_refrigeratorNone	-14.302
## in.misc_freezerNone	-42.186
## in.misc_gas_fireplaceNone	-61.313
## in.misc_gas_grillNone	-25.341
## in.misc_gas_lightingNone	-13.019
## in.misc_hot_tub_spGas	34.923
## in.misc_hot_tub_spNone	-112.058
## in.misc_poolNone	-125.495
## in.misc_pool_heaterGas	62.452
## in.misc_pool_heaterNone	-39.489
## in.misc_pool_heaterSolar	-17.023
## in.misc_pool_pumpNone	NA
## in.misc_well_pumpTypical Efficiency	21.787
## in.occupants10+	73.893
## in.occupants2	52.480
## in.occupants3	86.963
## in.occupants4	114.585
## in.occupants5	117.406
## in.occupants6	95.586
## in.occupants7	89.650
## in.occupants8	64.075
## in.occupants9	42.456
## in.orientationNorth	-22.720
## in.orientationNortheast	-9.505
## in.orientationNorthwest	-3.439
## in.orientationSouth	-21.508
## in.orientationSoutheast	-2.731
## in.orientationSouthwest	-1.383
## in.orientationWest	-4.306
## in.plug_load_diversity200%	NA
## in.plug_load_diversity50%	NA
## in.pumaG45000102	NA
## in.pumaG45000103	NA
## in.pumaG45000104	NA
## in.pumaG45000105	NA

## in.pumaG45000200	NA
## in.pumaG45000301	NA
## in.pumaG45000302	NA
## in.pumaG45000400	NA
## in.pumaG45000501	NA
## in.pumaG45000502	NA
## in.pumaG45000601	NA
## in.pumaG45000602	NA
## in.pumaG45000603	NA
## in.pumaG45000604	NA
## in.pumaG45000605	NA
## in.pumaG45000700	NA
## in.pumaG45000800	NA
## in.pumaG45000900	NA
## in.pumaG45001000	NA
## in.pumaG45001101	NA
## in.pumaG45001102	NA
## in.pumaG45001201	NA
## in.pumaG45001202	NA
## in.pumaG45001203	NA
## in.pumaG45001204	NA
## in.pumaG45001300	NA
## in.pumaG45001400	NA
## in.pumaG45001500	NA
## in.pumaG45001600	NA
## in.puma_metro_statusNot/partially in metro area	NA
## in.pv_orientationNone	NA
## in.pv_orientationNorth	2.794
## in.pv_orientationSouth	1.607
## in.pv_orientationSoutheast	0.827
## in.pv_orientationSouthwest	0.619
## in.pv_orientationWest	5.450
## in.pv_system_size11.0 kWDC	38.599
## in.pv_system_size13.0 kWDC	43.193
## in.pv_system_size3.0 kWDC	8.737
## in.pv_system_size5.0 kWDC	15.696
## in.pv_system_size7.0 kWDC	25.816
## in.pv_system_size9.0 kWDC	33.482
## in.pv_system_sizeNone	NA
## in.range_spot_vent_hour	-3.418
## in.reeds_balancing_area	NA
## in.refrigeratorEF 10.5, 100% Usage	-1.512
## in.refrigeratorEF 15.9, 100% Usage	-6.808
## in.refrigeratorEF 17.6, 100% Usage	-6.963
## in.refrigeratorEF 19.9, 100% Usage	-9.460
## in.refrigeratorEF 6.7, 100% Usage	11.722
## in.refrigeratorNone	-7.914
## in.roof_materialComposition Shingles	2.329
## in.roof_materialMetal, Dark	5.727
## in.roof_materialSlate	0.014
## in.roof_materialTile, Clay or Ceramic	1.696
## in.roof_materialTile, Concrete	0.191
## in.roof_materialWood Shingles	3.336
## in.tenureRenter	5.902
## in.usage_levelLow	NA
## in.usage_levelMedium	NA

## in.vacancy_statusVacant	-202.490
## in.vintage1940s	-0.043
## in.vintage1950s	-2.973
## in.vintage1960s	-5.291
## in.vintage1970s	-3.457
## in.vintage1980s	2.428
## in.vintage1990s	1.336
## in.vintage2000s	-7.784
## in.vintage2010s	-8.747
## in.vintage_acs1940-59	NA
## in.vintage_acs1960-79	NA
## in.vintage_acs1980-99	NA
## in.vintage_acs2000-09	NA
## in.vintage_acs2010s	NA
## in.water_heater_efficiencyElectric Premium	2.928
## in.water_heater_efficiencyElectric Standard	1.642
## in.water_heater_efficiencyElectric Tankless	15.633
## in.water_heater_efficiencyFuel Oil Standard	0.391
## in.water_heater_efficiencyNatural Gas Premium	1.985
## in.water_heater_efficiencyNatural Gas Standard	1.667
## in.water_heater_efficiencyNatural Gas Tankless	4.784
## in.water_heater_efficiencyOther Fuel	3.486
## in.water_heater_efficiencyPropane Premium	-2.485
## in.water_heater_efficiencyPropane Standard	0.163
## in.water_heater_efficiencyPropane Tankless	-0.255
## in.water_heater_fuelFuel Oil	NA
## in.water_heater_fuelNatural Gas	NA
## in.water_heater_fuelOther Fuel	NA
## in.water_heater_fuelPropane	NA
## in.weather_file_cityAugusta Bush Field	NA
## in.weather_file_cityBeaufort Mcas	NA
## in.weather_file_cityCharleston Muni	NA
## in.weather_file_cityColumbia Metro	NA
## in.weather_file_cityColumbia Owens Apt	NA
## in.weather_file_cityDaniel Field	NA
## in.weather_file_cityFlorence Rgnl	NA
## in.weather_file_cityGreenville Greenvil	NA
## in.weather_file_cityGreenwood Co	NA
## in.weather_file_cityMaxton	NA
## in.weather_file_cityMonroe Airport	NA
## in.weather_file_cityMyrtle Beach Civ	NA
## in.weather_file_cityOconee Co Rgnl	NA
## in.weather_file_cityOrangeburg Muni	NA
## in.weather_file_cityRock Hill York Co	NA
## in.weather_file_cityRutherfordton	NA
## in.weather_file_cityShaw Afb Sumter	NA
## in.weather_file_latitude	NA
## in.weather_file_longitude	-0.487
## in.window_areasF15 B15 L15 R15	11.937
## in.window_areasF18 B18 L18 R18	28.723
## in.window_areasF30 B30 L30 R30	53.816
## in.window_areasF6 B6 L6 R6	-17.186
## in.window_areasF9 B9 L9 R9	-12.694
## in.windowsDouble, Clear, Metal, Air, Exterior Clear Storm	-0.403
## in.windowsDouble, Clear, Non-metal, Air	-12.035
## in.windowsDouble, Clear, Non-metal, Air, Exterior Clear Storm	-6.958

## in.windowsDouble, Low-E, Non-metal, Air, M-Gain	-24.473
## in.windowsSingle, Clear, Metal	3.862
## in.windowsSingle, Clear, Metal, Exterior Clear Storm	-5.657
## in.windowsSingle, Clear, Non-metal	-3.532
## in.windowsSingle, Clear, Non-metal, Exterior Clear Storm	-10.461
## in.windowsTriple, Low-E, Non-metal, Air, L-Gain	-8.355
## upgrade.insulation_roofFinished, R-30	NA
## upgrade.water_heater_efficiencyElectric Heat Pump, 50 gal, 3.45 UEF	1.449
## upgrade.water_heater_efficiencyElectric Heat Pump, 66 gal, 3.35 UEF	0.906
## upgrade.water_heater_efficiencyElectric Heat Pump, 80 gal, 3.45 UEF	NA
## upgrade.infiltration_reduction30%	0.847
## upgrade.geometry.foundation_typeUnvented Crawlspace	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 100% Usage	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 120% Usage	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 80% Usage	NA
## upgrade.insulation_ceilingR-49	NA
## upgrade.ducts10% Leakage, R-8	NA
## upgrade.hvac_heating_typeDucted Heat Pump	NA
## upgrade.insulation_wallWood Stud, R-13	NA
## upgrade.insulation.foundation_wallWall R-10, Interior	-6.368
## upgrade.hvac_heating_efficiencyMSHP, SEER 29.3, 14 HSPF, Max Load	NA
## upgrade.cooking_rangeElectric, Induction, 100% Usage	NA
## upgrade.cooking_rangeElectric, Induction, 120% Usage	NA
## upgrade.cooking_rangeElectric, Induction, 80% Usage	NA
## county_idG4500030	NA
## county_idG4500050	NA
## county_idG4500070	NA
## county_idG4500090	NA
## county_idG4500110	NA
## county_idG4500130	NA
## county_idG4500150	NA
## county_idG4500170	NA
## county_idG4500190	NA
## county_idG4500210	NA
## county_idG4500230	NA
## county_idG4500250	NA
## county_idG4500270	NA
## county_idG4500290	NA
## county_idG4500310	NA
## county_idG4500330	NA
## county_idG4500350	NA
## county_idG4500370	NA
## county_idG4500390	NA
## county_idG4500410	NA
## county_idG4500430	NA
## county_idG4500450	NA
## county_idG4500470	NA
## county_idG4500490	NA
## county_idG4500510	NA
## county_idG4500530	NA
## county_idG4500550	NA
## county_idG4500570	NA
## county_idG4500590	NA
## county_idG4500610	NA
## county_idG4500630	NA
## county_idG4500650	NA

## county_idG4500670	NA
## county_idG4500690	NA
## county_idG4500710	NA
## county_idG4500730	NA
## county_idG4500750	NA
## county_idG4500770	NA
## county_idG4500790	NA
## county_idG4500810	NA
## county_idG4500830	NA
## county_idG4500850	NA
## county_idG4500870	NA
## county_idG4500890	NA
## county_idG4500910	NA
## date_time2018-07-02	NA
## date_time2018-07-03	NA
## date_time2018-07-04	NA
## date_time2018-07-05	NA
## date_time2018-07-06	NA
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## date_time2018-07-11	NA
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## date_time2018-07-14	NA
## date_time2018-07-15	NA
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## date_time2018-07-22	NA
## date_time2018-07-23	NA
## date_time2018-07-24	NA
## date_time2018-07-25	NA
## date_time2018-07-26	NA
## date_time2018-07-27	NA
## date_time2018-07-28	NA
## date_time2018-07-29	NA
## date_time2018-07-30	NA
## date_time2018-07-31	NA
## Direct_Normal_Radiation	2.196
## Diffuse_Horizontal_Radiation	3.058
## Dry_Bulb_Temperature	49.103
## Relative_Humidity	-0.731
## Wind_Speed	9.701
## Wind_Direction	3.357
## Global_Horizontal_Radiation	4.331
##	Pr(> t)
## (Intercept)	0.626327
## in.countyG4500030	0.626327
## in.countyG4500050	0.626327
## in.countyG4500070	0.626327
## in.countyG4500090	0.626327

## in.countyG4500110	0.626327
## in.countyG4500130	0.626327
## in.countyG4500150	0.626327
## in.countyG4500170	0.626327
## in.countyG4500190	0.626327
## in.countyG4500210	0.626327
## in.countyG4500230	0.626327
## in.countyG4500250	0.626327
## in.countyG4500270	0.626327
## in.countyG4500290	0.626327
## in.countyG4500310	0.626327
## in.countyG4500330	0.626327
## in.countyG4500350	0.626327
## in.countyG4500370	0.626327
## in.countyG4500390	0.626327
## in.countyG4500410	0.626327
## in.countyG4500430	0.626327
## in.countyG4500450	0.626327
## in.countyG4500470	0.000614
## in.countyG4500490	0.626327
## in.countyG4500510	0.626327
## in.countyG4500530	0.626327
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## in.countyG4500570	0.626327
## in.countyG4500590	0.013416
## in.countyG4500610	0.626327
## in.countyG4500630	0.626327
## in.countyG4500650	0.083429
## in.countyG4500670	0.626327
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## in.countyG4500710	0.626327
## in.countyG4500730	0.626327
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## in.countyG4500810	0.036375
## in.countyG4500830	0.626327
## in.countyG4500850	0.626327
## in.countyG4500870	0.626327
## in.countyG4500890	0.626327
## in.countyG4500910	0.626327
## date2018-07-02	< 2e-16
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## date2018-07-04	< 2e-16
## date2018-07-05	< 2e-16
## date2018-07-06	< 2e-16
## date2018-07-07	< 2e-16
## date2018-07-08	< 2e-16
## date2018-07-09	< 2e-16
## date2018-07-10	< 2e-16
## date2018-07-11	< 2e-16
## date2018-07-12	< 2e-16
## date2018-07-13	< 2e-16
## date2018-07-14	< 2e-16
## date2018-07-15	< 2e-16
## date2018-07-16	< 2e-16

## date2018-07-17	< 2e-16
## date2018-07-18	< 2e-16
## date2018-07-19	< 2e-16
## date2018-07-20	< 2e-16
## date2018-07-21	< 2e-16
## date2018-07-22	< 2e-16
## date2018-07-23	< 2e-16
## date2018-07-24	< 2e-16
## date2018-07-25	< 2e-16
## date2018-07-26	< 2e-16
## date2018-07-27	< 2e-16
## date2018-07-28	< 2e-16
## date2018-07-29	< 2e-16
## date2018-07-30	< 2e-16
## date2018-07-31	< 2e-16
## bldg_id	0.163008
## in.sqft	< 2e-16
## in.bathroom_spot_vent_hour	< 2e-16
## in.bedrooms	0.016101
## in.building_americana_climate_zoneMixed-Humid	NA
## in.ceiling_fanStandard Efficiency	< 2e-16
## in.ceiling_fanStandard Efficiency, No usage	< 2e-16
## in.cityNot in a census Place	3.70e-07
## in.citySC, Charleston	1.59e-07
## in.citySC, Columbia	0.000545
## in.citySC, Florence	0.297211
## in.citySC, Goose Creek	0.000414
## in.citySC, Greenville	0.002124
## in.citySC, Hilton Head Island	0.683177
## in.citySC, Mount Pleasant	0.000945
## in.citySC, Myrtle Beach	0.306473
## in.citySC, North Charleston	0.000573
## in.citySC, North Myrtle Beach	0.041414
## in.citySC, Rock Hill	0.172973
## in.citySC, Spartanburg	0.115322
## in.citySC, Summerville	4.07e-07
## in.citySC, Sumter	0.243679
## in.clothes_dryerElectric, 120% Usage	0.927772
## in.clothes_dryerElectric, 80% Usage	3.06e-05
## in.clothes_dryerGas, 100% Usage	0.080277
## in.clothes_dryerGas, 120% Usage	0.058349
## in.clothes_dryerGas, 80% Usage	4.99e-06
## in.clothes_dryerNone	0.876007
## in.clothes_dryerPropane, 100% Usage	9.02e-06
## in.clothes_dryerPropane, 120% Usage	0.945033
## in.clothes_dryerPropane, 80% Usage	0.002107
## in.clothes_washerEnergyStar, 120% Usage	0.026190
## in.clothes_washerEnergyStar, 80% Usage	0.000118
## in.clothes_washerNone	0.066147
## in.clothes_washerStandard, 100% Usage	< 2e-16
## in.clothes_washerStandard, 120% Usage	1.44e-07
## in.clothes_washerStandard, 80% Usage	0.000298
## in.clothes_washer_presenceYes	NA
## in.cooking_rangeElectric, 120% Usage	1.00e-13
## in.cooking_rangeElectric, 80% Usage	0.337584
## in.cooking_rangeGas, 100% Usage	0.471884

## in.cooking_rangeGas, 120% Usage	2.92e-08
## in.cooking_rangeGas, 80% Usage	0.009269
## in.cooking_rangeNone	< 2e-16
## in.cooking_rangePropane, 100% Usage	0.000752
## in.cooking_rangePropane, 120% Usage	0.037597
## in.cooking_rangePropane, 80% Usage	0.140683
## in.cooling_setpoint	< 2e-16
## in.cooling_setpoint_has_offsetYes	2.04e-10
## in.cooling_setpoint_offset_magnitude	< 2e-16
## in.cooling_setpoint_offset_periodDay and Night Setup -1h	0.427952
## in.cooling_setpoint_offset_periodDay and Night Setup -2h	0.005191
## in.cooling_setpoint_offset_periodDay and Night Setup -3h	0.000130
## in.cooling_setpoint_offset_periodDay and Night Setup -4h	0.703896
## in.cooling_setpoint_offset_periodDay and Night Setup -5h	1.82e-05
## in.cooling_setpoint_offset_periodDay and Night Setup +1h	0.017803
## in.cooling_setpoint_offset_periodDay and Night Setup +2h	2.14e-05
## in.cooling_setpoint_offset_periodDay and Night Setup +3h	0.447698
## in.cooling_setpoint_offset_periodDay and Night Setup +4h	2.20e-09
## in.cooling_setpoint_offset_periodDay and Night Setup +5h	6.53e-09
## in.cooling_setpoint_offset_periodDay Setup	0.790767
## in.cooling_setpoint_offset_periodDay Setup -1h	0.719571
## in.cooling_setpoint_offset_periodDay Setup -2h	0.144128
## in.cooling_setpoint_offset_periodDay Setup -3h	0.182340
## in.cooling_setpoint_offset_periodDay Setup -4h	0.000127
## in.cooling_setpoint_offset_periodDay Setup -5h	0.462638
## in.cooling_setpoint_offset_periodDay Setup +1h	0.174370
## in.cooling_setpoint_offset_periodDay Setup +2h	0.001222
## in.cooling_setpoint_offset_periodDay Setup +3h	1.11e-06
## in.cooling_setpoint_offset_periodDay Setup +4h	0.369656
## in.cooling_setpoint_offset_periodDay Setup +5h	5.06e-10
## in.cooling_setpoint_offset_periodDay Setup and Night Setback	0.334941
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -1h	1.09e-07
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -2h	< 2e-16
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -3h	< 2e-16
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -4h	< 2e-16
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -5h	< 2e-16
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +1h	0.095899
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +2h	< 2e-16
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +3h	0.019859
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +4h	4.51e-05
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +5h	0.010848
## in.cooling_setpoint_offset_periodNight Setback	1.73e-06
## in.cooling_setpoint_offset_periodNight Setback -1h	0.000225
## in.cooling_setpoint_offset_periodNight Setback -2h	6.49e-05
## in.cooling_setpoint_offset_periodNight Setback -3h	< 2e-16
## in.cooling_setpoint_offset_periodNight Setback -4h	< 2e-16
## in.cooling_setpoint_offset_periodNight Setback -5h	5.71e-16
## in.cooling_setpoint_offset_periodNight Setback +1h	2.82e-05
## in.cooling_setpoint_offset_periodNight Setback +2h	4.05e-06
## in.cooling_setpoint_offset_periodNight Setback +3h	8.39e-11
## in.cooling_setpoint_offset_periodNight Setback +4h	0.982855
## in.cooling_setpoint_offset_periodNight Setback +5h	0.010059
## in.cooling_setpoint_offset_periodNight Setup	0.474327
## in.cooling_setpoint_offset_periodNight Setup -1h	0.242499
## in.cooling_setpoint_offset_periodNight Setup -2h	0.011755
## in.cooling_setpoint_offset_periodNight Setup -3h	0.145677

## in.cooling_setpoint_offset_periodNight Setup -4h	0.410673
## in.cooling_setpoint_offset_periodNight Setup -5h	0.190908
## in.cooling_setpoint_offset_periodNight Setup +1h	0.012186
## in.cooling_setpoint_offset_periodNight Setup +2h	0.163451
## in.cooling_setpoint_offset_periodNight Setup +3h	0.030605
## in.cooling_setpoint_offset_periodNight Setup +4h	0.525568
## in.cooling_setpoint_offset_periodNight Setup +5h	0.337647
## in.cooling_setpoint_offset_periodNone	NA
## in.county_and_pumaG4500030, G45001500	NA
## in.county_and_pumaG4500050, G45001300	NA
## in.county_and_pumaG4500070, G45000200	NA
## in.county_and_pumaG4500090, G45001300	NA
## in.county_and_pumaG4500110, G45001300	NA
## in.county_and_pumaG4500130, G45001400	NA
## in.county_and_pumaG4500150, G45001201	< 2e-16
## in.county_and_pumaG4500150, G45001202	0.175757
## in.county_and_pumaG4500150, G45001203	< 2e-16
## in.county_and_pumaG4500150, G45001204	NA
## in.county_and_pumaG4500170, G45000605	NA
## in.county_and_pumaG4500190, G45001201	0.461511
## in.county_and_pumaG4500190, G45001202	0.436141
## in.county_and_pumaG4500190, G45001203	0.010780
## in.county_and_pumaG4500190, G45001204	NA
## in.county_and_pumaG4500210, G45000400	NA
## in.county_and_pumaG4500230, G45000400	NA
## in.county_and_pumaG4500250, G45000700	NA
## in.county_and_pumaG4500270, G45000800	NA
## in.county_and_pumaG4500290, G45001300	NA
## in.county_and_pumaG4500310, G45000900	NA
## in.county_and_pumaG4500330, G45001000	NA
## in.county_and_pumaG4500350, G45001201	0.389363
## in.county_and_pumaG4500350, G45001204	NA
## in.county_and_pumaG4500370, G45001500	NA
## in.county_and_pumaG4500390, G45000603	NA
## in.county_and_pumaG4500410, G45000900	NA
## in.county_and_pumaG4500430, G45001000	NA
## in.county_and_pumaG4500450, G45000102	0.305927
## in.county_and_pumaG4500450, G45000103	9.28e-08
## in.county_and_pumaG4500450, G45000104	7.28e-07
## in.county_and_pumaG4500450, G45000105	NA
## in.county_and_pumaG4500470, G45001600	NA
## in.county_and_pumaG4500490, G45001300	NA
## in.county_and_pumaG4500510, G45001101	8.13e-06
## in.county_and_pumaG4500510, G45001102	NA
## in.county_and_pumaG4500530, G45001400	NA
## in.county_and_pumaG4500550, G45000605	NA
## in.county_and_pumaG4500570, G45000700	NA
## in.county_and_pumaG4500590, G45000105	NA
## in.county_and_pumaG4500610, G45000800	NA
## in.county_and_pumaG4500630, G45000601	0.340293
## in.county_and_pumaG4500630, G45000602	NA
## in.county_and_pumaG4500650, G45001600	NA
## in.county_and_pumaG4500670, G45001000	NA
## in.county_and_pumaG4500690, G45000700	NA
## in.county_and_pumaG4500710, G45000400	NA
## in.county_and_pumaG4500730, G45000101	NA

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## in.county_and_pumaG4500750, G45001300 NA
## in.county_and_pumaG4500770, G45000101 NA
## in.county_and_pumaG4500790, G45000603 4.44e-15
## in.county_and_pumaG4500790, G45000604 < 2e-16
## in.county_and_pumaG4500790, G45000605 NA
## in.county_and_pumaG4500810, G45000601 NA
## in.county_and_pumaG4500830, G45000301 0.267401
## in.county_and_pumaG4500830, G45000302 NA
## in.county_and_pumaG4500850, G45000800 NA
## in.county_and_pumaG4500870, G45000400 NA
## in.county_and_pumaG4500890, G45000800 NA
## in.county_and_pumaG4500910, G45000501 0.168915
## in.county_and_pumaG4500910, G45000502 NA
## in.dishwasher290 Rated kWh, 120% Usage 0.248507
## in.dishwasher290 Rated kWh, 80% Usage 0.042835
## in.dishwasher318 Rated kWh, 100% Usage 0.162884
## in.dishwasher318 Rated kWh, 120% Usage 1.65e-05
## in.dishwasher318 Rated kWh, 80% Usage 0.036156
## in.dishwasherNone < 2e-16
## in.ducts10% Leakage, R-4 1.94e-07
## in.ducts10% Leakage, R-6 5.63e-08
## in.ducts10% Leakage, R-8 < 2e-16
## in.ducts10% Leakage, Uninsulated 0.007997
## in.ducts20% Leakage, R-4 9.79e-08
## in.ducts20% Leakage, R-6 1.11e-13
## in.ducts20% Leakage, R-8 2.07e-14
## in.ducts20% Leakage, Uninsulated 0.002880
## in.ducts30% Leakage, R-4 6.95e-06
## in.ducts30% Leakage, R-6 5.34e-12
## in.ducts30% Leakage, R-8 4.68e-14
## in.ducts30% Leakage, Uninsulated 3.58e-09
## in.ductsNone 0.018313
## in.federal_poverty_level100-150% 8.00e-06
## in.federal_poverty_level150-200% 0.355847
## in.federal_poverty_level200-300% 2.86e-07
## in.federal_poverty_level300-400% 0.607120
## in.federal_poverty_level400%+ 0.000384
## in.geometry_attic_typeVented Attic 1.86e-12
## in.geometry_floor_area1000-1499 < 2e-16
## in.geometry_floor_area1500-1999 < 2e-16
## in.geometry_floor_area2000-2499 < 2e-16
## in.geometry_floor_area2500-2999 < 2e-16
## in.geometry_floor_area3000-3999 < 2e-16
## in.geometry_floor_area4000+ < 2e-16
## in.geometry_floor_area500-749 0.711678
## in.geometry_floor_area750-999 NA
## in.geometry_floor_area_bin1500-2499 NA
## in.geometry_floor_area_bin2500-3999 NA
## in.geometry_floor_area_bin4000+ NA
## in.geometry.foundation_typeHeated Basement 0.000181
## in.geometry.foundation_typeSlab < 2e-16
## in.geometry.foundation_typeUnheated Basement 0.000343
## in.geometry.foundation_typeUnvented Crawlspace 0.021777
## in.geometry.foundation_typeVented Crawlspace 0.002612
## in.geometry.garage < 2e-16
## in.geometry_stories < 2e-16

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## in.geometry_stories_low_rise	NA
## in.geometry_wall_exterior_finishBrick, Light	0.043975
## in.geometry_wall_exterior_finishBrick, Medium/Dark	0.035065
## in.geometry_wall_exterior_finishFiber-Cement, Light	0.087541
## in.geometry_wall_exterior_finishNone	0.857617
## in.geometry_wall_exterior_finishShingle, Asbestos, Medium	0.006421
## in.geometry_wall_exterior_finishShingle, Composition, Medium	0.512823
## in.geometry_wall_exterior_finishStucco, Light	0.026841
## in.geometry_wall_exterior_finishVinyl, Light	0.274019
## in.geometry_wall_exterior_finishWood, Medium/Dark	0.132522
## in.geometry_wall_typeConcrete	3.20e-16
## in.geometry_wall_typeSteel Frame	0.196807
## in.geometry_wall_typeWood Frame	0.026050
## in.has_pvYes	0.002280
## in.heating_fuelFuel Oil	0.587709
## in.heating_fuelNatural Gas	0.614239
## in.heating_fuelNone	0.387919
## in.heating_fuelOther Fuel	0.847933
## in.heating_fuelPropane	0.148443
## in.heating_setpoint	< 2e-16
## in.heating_setpoint_has_offsetYes	0.016665
## in.heating_setpoint_offset_magnitude	< 2e-16
## in.heating_setpoint_offset_periodDay -1h	0.190376
## in.heating_setpoint_offset_periodDay -2h	0.183308
## in.heating_setpoint_offset_periodDay -3h	0.308158
## in.heating_setpoint_offset_periodDay -4h	2.03e-07
## in.heating_setpoint_offset_periodDay -5h	0.068429
## in.heating_setpoint_offset_periodDay +1h	1.81e-05
## in.heating_setpoint_offset_periodDay +2h	0.378566
## in.heating_setpoint_offset_periodDay +3h	0.159988
## in.heating_setpoint_offset_periodDay +4h	0.503605
## in.heating_setpoint_offset_periodDay +5h	3.71e-08
## in.heating_setpoint_offset_periodDay and Night	2.28e-10
## in.heating_setpoint_offset_periodDay and Night -1h	0.107373
## in.heating_setpoint_offset_periodDay and Night -2h	0.194938
## in.heating_setpoint_offset_periodDay and Night -3h	0.470025
## in.heating_setpoint_offset_periodDay and Night -4h	0.138629
## in.heating_setpoint_offset_periodDay and Night -5h	0.076987
## in.heating_setpoint_offset_periodDay and Night +1h	8.24e-05
## in.heating_setpoint_offset_periodDay and Night +2h	0.403343
## in.heating_setpoint_offset_periodDay and Night +3h	1.36e-09
## in.heating_setpoint_offset_periodDay and Night +4h	0.070362
## in.heating_setpoint_offset_periodDay and Night +5h	0.000641
## in.heating_setpoint_offset_periodNight	0.944058
## in.heating_setpoint_offset_periodNight -1h	2.53e-09
## in.heating_setpoint_offset_periodNight -2h	0.066158
## in.heating_setpoint_offset_periodNight -3h	5.19e-06
## in.heating_setpoint_offset_periodNight -4h	0.002501
## in.heating_setpoint_offset_periodNight -5h	0.616720
## in.heating_setpoint_offset_periodNight +1h	0.962447
## in.heating_setpoint_offset_periodNight +2h	0.006630
## in.heating_setpoint_offset_periodNight +3h	0.140698
## in.heating_setpoint_offset_periodNight +4h	0.018294
## in.heating_setpoint_offset_periodNight +5h	0.031181
## in.heating_setpoint_offset_periodNone	NA
## in.hot_water_fixtures200% Usage	< 2e-16

## in.hot_water_fixtures50% Usage	< 2e-16
## in.hvac_cooling_efficiencyAC, SEER 13	0.977746
## in.hvac_cooling_efficiencyAC, SEER 15	0.075961
## in.hvac_cooling_efficiencyAC, SEER 8	0.503166
## in.hvac_cooling_efficiencyHeat Pump	0.020171
## in.hvac_cooling_efficiencyNone	6.92e-09
## in.hvac_cooling_efficiencyRoom AC, EER 10.7	0.628398
## in.hvac_cooling_efficiencyRoom AC, EER 12.0	0.014795
## in.hvac_cooling_efficiencyRoom AC, EER 8.5	0.000475
## in.hvac_cooling_efficiencyRoom AC, EER 9.8	0.221100
## in.hvac_cooling_partial_space_conditioning20% Conditioned	0.003454
## in.hvac_cooling_partial_space_conditioning40% Conditioned	1.93e-09
## in.hvac_cooling_partial_space_conditioning60% Conditioned	0.543266
## in.hvac_cooling_partial_space_conditioning80% Conditioned	0.001764
## in.hvac_cooling_partial_space_conditioningNone	NA
## in.hvac_cooling_typeHeat Pump	NA
## in.hvac_cooling_typeNone	NA
## in.hvac_cooling_typeRoom AC	NA
## in.hvac_has_ductsYes	NA
## in.hvac_has_zonal_electric_heatingYes	0.540009
## in.hvac_heating_efficiencyASHP, SEER 13, 7.7 HSPF	4.01e-06
## in.hvac_heating_efficiencyASHP, SEER 15, 8.5 HSPF	0.000301
## in.hvac_heating_efficiencyElectric Baseboard, 100% Efficiency	NA
## in.hvac_heating_efficiencyElectric Boiler, 100% AFUE	6.69e-07
## in.hvac_heating_efficiencyElectric Furnace, 100% AFUE	0.407696
## in.hvac_heating_efficiencyElectric Wall Furnace, 100% AFUE	NA
## in.hvac_heating_efficiencyFuel Boiler, 76% AFUE	1.03e-05
## in.hvac_heating_efficiencyFuel Boiler, 80% AFUE	6.41e-07
## in.hvac_heating_efficiencyFuel Boiler, 90% AFUE	0.030200
## in.hvac_heating_efficiencyFuel Furnace, 60% AFUE	0.003662
## in.hvac_heating_efficiencyFuel Furnace, 76% AFUE	0.607187
## in.hvac_heating_efficiencyFuel Furnace, 80% AFUE	0.360934
## in.hvac_heating_efficiencyFuel Furnace, 92.5% AFUE	0.119019
## in.hvac_heating_efficiencyFuel Wall/Floor Furnace, 60% AFUE	0.008951
## in.hvac_heating_efficiencyFuel Wall/Floor Furnace, 68% AFUE	NA
## in.hvac_heating_efficiencyNone	NA
## in.hvac_heating_efficiencyOther	NA
## in.hvac_heating_typeDucted Heating	0.023264
## in.hvac_heating_typeNon-Ducted Heating	NA
## in.hvac_heating_typeNone	NA
## in.hvac_heating_type_and_fuelElectricity Baseboard	NA
## in.hvac_heating_type_and_fuelElectricity Electric Boiler	NA
## in.hvac_heating_type_and_fuelElectricity Electric Furnace	NA
## in.hvac_heating_type_and_fuelElectricity Electric Wall Furnace	NA
## in.hvac_heating_type_and_fuelFuel Oil Fuel Boiler	0.427238
## in.hvac_heating_type_and_fuelFuel Oil Fuel Furnace	0.491783
## in.hvac_heating_type_and_fuelFuel Oil Fuel Wall/Floor Furnace	NA
## in.hvac_heating_type_and_fuelNatural Gas Fuel Boiler	4.08e-05
## in.hvac_heating_type_and_fuelNatural Gas Fuel Furnace	0.000255
## in.hvac_heating_type_and_fuelNatural Gas Fuel Wall/Floor Furnace	NA
## in.hvac_heating_type_and_fuelNone	NA
## in.hvac_heating_type_and_fuelPropane Fuel Boiler	NA
## in.hvac_heating_type_and_fuelPropane Fuel Furnace	NA
## in.hvac_heating_type_and_fuelPropane Fuel Wall/Floor Furnace	NA
## in.income	3.22e-05
## in.income_recs_2015	5.70e-06

## in.income_recs_2020	0.007084
## in.infiltration	< 2e-16
## in.insulation_ceilingR-13	0.798603
## in.insulation_ceilingR-19	0.002223
## in.insulation_ceilingR-30	0.865399
## in.insulation_ceilingR-38	0.224511
## in.insulation_ceilingR-49	8.83e-10
## in.insulation_ceilingR-7	0.000500
## in.insulation_ceilingUninsulated	NA
## in.insulation_floorCeiling R-19	0.034990
## in.insulation_floorNone	NA
## in.insulation_floorUninsulated	< 2e-16
## in.insulation.foundation_wallUninsulated	4.32e-14
## in.insulation.foundation_wallWall R-10, Exterior	0.026137
## in.insulation.foundation_wallWall R-15, Exterior	0.993424
## in.insulation.foundation_wallWall R-5, Exterior	NA
## in.insulation_rim_joistR-10, Exterior	NA
## in.insulation_rim_joistR-15, Exterior	NA
## in.insulation_rim_joistR-5, Exterior	NA
## in.insulation_rim_joistUninsulated	NA
## in.insulation_roofFinished, R-19	0.859273
## in.insulation_roofFinished, R-30	4.84e-07
## in.insulation_roofFinished, R-38	0.297102
## in.insulation_roofFinished, R-49	0.820049
## in.insulation_roofFinished, R-7	0.001986
## in.insulation_roofFinished, Uninsulated	0.018359
## in.insulation_roofUnfinished, Uninsulated	NA
## in.insulation_slab2ft R10 Under, Horizontal	0.104526
## in.insulation_slab2ft R5 Perimeter, Vertical	0.827750
## in.insulation_slab2ft R5 Under, Horizontal	0.001367
## in.insulation_slabNone	NA
## in.insulation_slabUninsulated	0.000304
## in.insulation_wallBrick, 12-in, 3-wythe, R-15	6.37e-08
## in.insulation_wallBrick, 12-in, 3-wythe, R-19	0.252436
## in.insulation_wallBrick, 12-in, 3-wythe, R-7	1.46e-05
## in.insulation_wallBrick, 12-in, 3-wythe, Uninsulated	< 2e-16
## in.insulation_wallCMU, 6-in Hollow, R-11	1.00e-14
## in.insulation_wallCMU, 6-in Hollow, R-15	< 2e-16
## in.insulation_wallCMU, 6-in Hollow, R-19	2.32e-11
## in.insulation_wallCMU, 6-in Hollow, R-7	0.559742
## in.insulation_wallCMU, 6-in Hollow, Uninsulated	NA
## in.insulation_wallWood Stud, R-11	0.150569
## in.insulation_wallWood Stud, R-15	0.765144
## in.insulation_wallWood Stud, R-19	0.004404
## in.insulation_wallWood Stud, R-7	3.22e-12
## in.insulation_wallWood Stud, Uninsulated	NA
## in.lighting100% Incandescent	< 2e-16
## in.lighting100% LED	< 2e-16
## in.misc_extra_refrigeratorEF 10.5	0.031286
## in.misc_extra_refrigeratorEF 15.9	7.94e-07
## in.misc_extra_refrigeratorEF 17.6	1.73e-08
## in.misc_extra_refrigeratorEF 19.9	0.001574
## in.misc_extra_refrigeratorEF 6.7	< 2e-16
## in.misc_extra_refrigeratorNone	< 2e-16
## in.misc_freezerNone	< 2e-16
## in.misc_gas_fireplaceNone	< 2e-16

## in.misc_gas_grillNone	< 2e-16
## in.misc_gas_lightingNone	< 2e-16
## in.misc_hot_tub_spaGas	< 2e-16
## in.misc_hot_tub_spaNone	< 2e-16
## in.misc_poolNone	< 2e-16
## in.misc_pool_heaterGas	< 2e-16
## in.misc_pool_heaterNone	< 2e-16
## in.misc_pool_heaterSolar	< 2e-16
## in.misc_pool_pumpNone	NA
## in.misc_well_pumpTypical Efficiency	< 2e-16
## in.occupants10+	< 2e-16
## in.occupants2	< 2e-16
## in.occupants3	< 2e-16
## in.occupants4	< 2e-16
## in.occupants5	< 2e-16
## in.occupants6	< 2e-16
## in.occupants7	< 2e-16
## in.occupants8	< 2e-16
## in.occupants9	< 2e-16
## in.orientationNorth	< 2e-16
## in.orientationNortheast	< 2e-16
## in.orientationNorthwest	0.000583
## in.orientationSouth	< 2e-16
## in.orientationSoutheast	0.006316
## in.orientationSouthwest	0.166574
## in.orientationWest	1.66e-05
## in.plug_load_diversity200%	NA
## in.plug_load_diversity50%	NA
## in.pumaG45000102	NA
## in.pumaG45000103	NA
## in.pumaG45000104	NA
## in.pumaG45000105	NA
## in.pumaG45000200	NA
## in.pumaG45000301	NA
## in.pumaG45000302	NA
## in.pumaG45000400	NA
## in.pumaG45000501	NA
## in.pumaG45000502	NA
## in.pumaG45000601	NA
## in.pumaG45000602	NA
## in.pumaG45000603	NA
## in.pumaG45000604	NA
## in.pumaG45000605	NA
## in.pumaG45000700	NA
## in.pumaG45000800	NA
## in.pumaG45000900	NA
## in.pumaG45001000	NA
## in.pumaG45001101	NA
## in.pumaG45001102	NA
## in.pumaG45001201	NA
## in.pumaG45001202	NA
## in.pumaG45001203	NA
## in.pumaG45001204	NA
## in.pumaG45001300	NA
## in.pumaG45001400	NA
## in.pumaG45001500	NA

## in.pumaG45001600	NA
## in.puma_metro_statusNot/partially in metro area	NA
## in.pv_orientationNone	NA
## in.pv_orientationNorth	0.005207
## in.pv_orientationSouth	0.108048
## in.pv_orientationSoutheast	0.408243
## in.pv_orientationSouthwest	0.535806
## in.pv_orientationWest	5.04e-08
## in.pv_system_size11.0 kWDC	< 2e-16
## in.pv_system_size13.0 kWDC	< 2e-16
## in.pv_system_size3.0 kWDC	< 2e-16
## in.pv_system_size5.0 kWDC	< 2e-16
## in.pv_system_size7.0 kWDC	< 2e-16
## in.pv_system_size9.0 kWDC	< 2e-16
## in.pv_system_sizeNone	NA
## in.range_spot_vent_hour	0.000630
## in.reeds_balancing_area	NA
## in.refrigeratorEF 10.5, 100% Usage	0.130455
## in.refrigeratorEF 15.9, 100% Usage	9.92e-12
## in.refrigeratorEF 17.6, 100% Usage	3.34e-12
## in.refrigeratorEF 19.9, 100% Usage	< 2e-16
## in.refrigeratorEF 6.7, 100% Usage	< 2e-16
## in.refrigeratorNone	2.51e-15
## in.roof_materialComposition Shingles	0.019861
## in.roof_materialMetal, Dark	1.02e-08
## in.roof_materialSlate	0.988900
## in.roof_materialTile, Clay or Ceramic	0.089798
## in.roof_materialTile, Concrete	0.848510
## in.roof_materialWood Shingles	0.000851
## in.tenureRenter	3.61e-09
## in.usage_levelLow	NA
## in.usage_levelMedium	NA
## in.vacancy_statusVacant	< 2e-16
## in.vintage1940s	0.965799
## in.vintage1950s	0.002949
## in.vintage1960s	1.22e-07
## in.vintage1970s	0.000546
## in.vintage1980s	0.015197
## in.vintage1990s	0.181667
## in.vintage2000s	7.08e-15
## in.vintage2010s	< 2e-16
## in.vintage_acs1940-59	NA
## in.vintage_acs1960-79	NA
## in.vintage_acs1980-99	NA
## in.vintage_acs2000-09	NA
## in.vintage_acs2010s	NA
## in.water_heater_efficiencyElectric Premium	0.003412
## in.water_heater_efficiencyElectric Standard	0.100565
## in.water_heater_efficiencyElectric Tankless	< 2e-16
## in.water_heater_efficiencyFuel Oil Standard	0.695879
## in.water_heater_efficiencyNatural Gas Premium	0.047149
## in.water_heater_efficiencyNatural Gas Standard	0.095427
## in.water_heater_efficiencyNatural Gas Tankless	1.72e-06
## in.water_heater_efficiencyOther Fuel	0.000490
## in.water_heater_efficiencyPropane Premium	0.012949
## in.water_heater_efficiencyPropane Standard	0.870479

## in.water_heater_efficiencyPropane Tankless	0.798685
## in.water_heater_fuelFuel Oil	NA
## in.water_heater_fuelNatural Gas	NA
## in.water_heater_fuelOther Fuel	NA
## in.water_heater_fuelPropane	NA
## in.weather_file_cityAugusta Bush Field	NA
## in.weather_file_cityBeaufort Mcas	NA
## in.weather_file_cityCharleston Muni	NA
## in.weather_file_cityColumbia Metro	NA
## in.weather_file_cityColumbia Owens Apt	NA
## in.weather_file_cityDaniel Field	NA
## in.weather_file_cityFlorence Rgnl	NA
## in.weather_file_cityGreenville Greenvil	NA
## in.weather_file_cityGreenwood Co	NA
## in.weather_file_cityMaxton	NA
## in.weather_file_cityMonroe Airport	NA
## in.weather_file_cityMyrtle Beach Civ	NA
## in.weather_file_cityOconee Co Rgnl	NA
## in.weather_file_cityOrangeburg Muni	NA
## in.weather_file_cityRock Hill York Co	NA
## in.weather_file_cityRutherfordton	NA
## in.weather_file_cityShaw Afb Sumter	NA
## in.weather_file_latitude	NA
## in.weather_file_longitude	0.626327
## in.window_areasF15 B15 L15 R15	< 2e-16
## in.window_areasF18 B18 L18 R18	< 2e-16
## in.window_areasF30 B30 L30 R30	< 2e-16
## in.window_areasF6 B6 L6 R6	< 2e-16
## in.window_areasF9 B9 L9 R9	< 2e-16
## in.windowsDouble, Clear, Metal, Air, Exterior Clear Storm	0.686710
## in.windowsDouble, Clear, Non-metal, Air	< 2e-16
## in.windowsDouble, Clear, Non-metal, Air, Exterior Clear Storm	3.48e-12
## in.windowsDouble, Low-E, Non-metal, Air, M-Gain	< 2e-16
## in.windowsSingle, Clear, Metal	0.000113
## in.windowsSingle, Clear, Metal, Exterior Clear Storm	1.54e-08
## in.windowsSingle, Clear, Non-metal	0.000412
## in.windowsSingle, Clear, Non-metal, Exterior Clear Storm	< 2e-16
## in.windowsTriple, Low-E, Non-metal, Air, L-Gain	< 2e-16
## upgrade.insulation_roofFinished, R-30	NA
## upgrade.water_heater_efficiencyElectric Heat Pump, 50 gal, 3.45 UEF	0.147271
## upgrade.water_heater_efficiencyElectric Heat Pump, 66 gal, 3.35 UEF	0.364822
## upgrade.water_heater_efficiencyElectric Heat Pump, 80 gal, 3.45 UEF	NA
## upgrade.infiltration_reduction30%	0.397084
## upgrade.geometry.foundation_typeUnvented Crawlspace	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 100% Usage	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 120% Usage	NA
## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 80% Usage	NA
## upgrade.insulation_ceilingR-49	NA
## upgrade.ducts10% Leakage, R-8	NA
## upgrade.hvac_heating_typeDucted Heat Pump	NA
## upgrade.insulation_wallWood Stud, R-13	NA
## upgrade.insulation.foundation_wallWall R-10, Interior	1.92e-10
## upgrade.hvac_heating_efficiencyMSHP, SEER 29.3, 14 HSPF, Max Load	NA
## upgrade.cooking_rangeElectric, Induction, 100% Usage	NA
## upgrade.cooking_rangeElectric, Induction, 120% Usage	NA
## upgrade.cooking_rangeElectric, Induction, 80% Usage	NA

```
## county_idG4500030          NA  
## county_idG4500050          NA  
## county_idG4500070          NA  
## county_idG4500090          NA  
## county_idG4500110          NA  
## county_idG4500130          NA  
## county_idG4500150          NA  
## county_idG4500170          NA  
## county_idG4500190          NA  
## county_idG4500210          NA  
## county_idG4500230          NA  
## county_idG4500250          NA  
## county_idG4500270          NA  
## county_idG4500290          NA  
## county_idG4500310          NA  
## county_idG4500330          NA  
## county_idG4500350          NA  
## county_idG4500370          NA  
## county_idG4500390          NA  
## county_idG4500410          NA  
## county_idG4500430          NA  
## county_idG4500450          NA  
## county_idG4500470          NA  
## county_idG4500490          NA  
## county_idG4500510          NA  
## county_idG4500530          NA  
## county_idG4500550          NA  
## county_idG4500570          NA  
## county_idG4500590          NA  
## county_idG4500610          NA  
## county_idG4500630          NA  
## county_idG4500650          NA  
## county_idG4500670          NA  
## county_idG4500690          NA  
## county_idG4500710          NA  
## county_idG4500730          NA  
## county_idG4500750          NA  
## county_idG4500770          NA  
## county_idG4500790          NA  
## county_idG4500810          NA  
## county_idG4500830          NA  
## county_idG4500850          NA  
## county_idG4500870          NA  
## county_idG4500890          NA  
## county_idG4500910          NA  
## date_time2018-07-02        NA  
## date_time2018-07-03        NA  
## date_time2018-07-04        NA  
## date_time2018-07-05        NA  
## date_time2018-07-06        NA  
## date_time2018-07-07        NA  
## date_time2018-07-08        NA  
## date_time2018-07-09        NA  
## date_time2018-07-10        NA  
## date_time2018-07-11        NA  
## date_time2018-07-12        NA
```

## date_time2018-07-13	NA
## date_time2018-07-14	NA
## date_time2018-07-15	NA
## date_time2018-07-16	NA
## date_time2018-07-17	NA
## date_time2018-07-18	NA
## date_time2018-07-19	NA
## date_time2018-07-20	NA
## date_time2018-07-21	NA
## date_time2018-07-22	NA
## date_time2018-07-23	NA
## date_time2018-07-24	NA
## date_time2018-07-25	NA
## date_time2018-07-26	NA
## date_time2018-07-27	NA
## date_time2018-07-28	NA
## date_time2018-07-29	NA
## date_time2018-07-30	NA
## date_time2018-07-31	NA
## Direct_Normal_Radiation	0.028078
## Diffuse_Horizontal_Radiation	0.002226
## Dry_Bulb_Temperature	< 2e-16
## Relative_Humidity	0.464527
## Wind_Speed	< 2e-16
## Wind_Direction	0.000787
## Global_Horizontal_Radiation	1.48e-05
##	
## (Intercept)	
## in.countyG4500030	
## in.countyG4500050	
## in.countyG4500070	
## in.countyG4500090	
## in.countyG4500110	
## in.countyG4500130	
## in.countyG4500150	
## in.countyG4500170	
## in.countyG4500190	
## in.countyG4500210	
## in.countyG4500230	
## in.countyG4500250	
## in.countyG4500270	
## in.countyG4500290	
## in.countyG4500310	
## in.countyG4500330	
## in.countyG4500350	
## in.countyG4500370	
## in.countyG4500390	
## in.countyG4500410	
## in.countyG4500430	
## in.countyG4500450	
## in.countyG4500470	***
## in.countyG4500490	
## in.countyG4500510	
## in.countyG4500530	
## in.countyG4500550	
## in.countyG4500570	

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## in.countyG4500590
## in.countyG4500610
## in.countyG4500630
## in.countyG4500650
## in.countyG4500670
## in.countyG4500690
## in.countyG4500710
## in.countyG4500730
## in.countyG4500750
## in.countyG4500770
## in.countyG4500790
## in.countyG4500810
## in.countyG4500830
## in.countyG4500850
## in.countyG4500870
## in.countyG4500890
## in.countyG4500910
## date2018-07-02
## date2018-07-03
## date2018-07-04
## date2018-07-05
## date2018-07-06
## date2018-07-07
## date2018-07-08
## date2018-07-09
## date2018-07-10
## date2018-07-11
## date2018-07-12
## date2018-07-13
## date2018-07-14
## date2018-07-15
## date2018-07-16
## date2018-07-17
## date2018-07-18
## date2018-07-19
## date2018-07-20
## date2018-07-21
## date2018-07-22
## date2018-07-23
## date2018-07-24
## date2018-07-25
## date2018-07-26
## date2018-07-27
## date2018-07-28
## date2018-07-29
## date2018-07-30
## date2018-07-31
## bldg_id
## in.sqft
## in.bathroom_spot_vent_hour
## in.bedrooms
## in.building_americana_climate_zoneMixed-Humid
## in.ceiling_fanStandard Efficiency
## in.ceiling_fanStandard Efficiency, No usage
## in.cityNot in a census Place
## in.citySC, Charleston

```

```

## in.citySC, Columbia                                ***
## in.citySC, Florence                               ***
## in.citySC, Goose Creek                           ***
## in.citySC, Greenville                            **
## in.citySC, Hilton Head Island                   ***
## in.citySC, Mount Pleasant                         ***
## in.citySC, Myrtle Beach                          ***
## in.citySC, North Charleston                      ***
## in.citySC, North Myrtle Beach                   *
## in.citySC, Rock Hill                            ***
## in.citySC, Spartanburg                          ***
## in.citySC, Summerville                           ***
## in.citySC, Sumter                             ***
## in.clothes_dryerElectric, 120% Usage           ***
## in.clothes_dryerElectric, 80% Usage             ***
## in.clothes_dryerGas, 100% Usage                .
## in.clothes_dryerGas, 120% Usage                .
## in.clothes_dryerGas, 80% Usage                ***
## in.clothes_dryerNone                           ***
## in.clothes_dryerPropane, 100% Usage            ***
## in.clothes_dryerPropane, 120% Usage            ***
## in.clothes_dryerPropane, 80% Usage              **
## in.clothes_washerEnergyStar, 120% Usage         *
## in.clothes_washerEnergyStar, 80% Usage          ***
## in.clothes_washerNone                           .
## in.clothes_washerStandard, 100% Usage          ***
## in.clothes_washerStandard, 120% Usage          ***
## in.clothes_washerStandard, 80% Usage            ***
## in.clothes_washer_presenceYes                  ***
## in.cooking_rangeElectric, 120% Usage           ***
## in.cooking_rangeElectric, 80% Usage             ***
## in.cooking_rangeGas, 100% Usage                ***
## in.cooking_rangeGas, 120% Usage                ***
## in.cooking_rangeGas, 80% Usage                **
## in.cooking_rangeNone                           ***
## in.cooking_rangePropane, 100% Usage            ***
## in.cooking_rangePropane, 120% Usage            *
## in.cooking_rangePropane, 80% Usage              ***
## in.cooling_setpoint                           ***
## in.cooling_setpoint_has_offsetYes             ***
## in.cooling_setpoint_offset_magnitude        ***
## in.cooling_setpoint_offset_periodDay and Night Setup -1h
## in.cooling_setpoint_offset_periodDay and Night Setup -2h      **
## in.cooling_setpoint_offset_periodDay and Night Setup -3h      ***
## in.cooling_setpoint_offset_periodDay and Night Setup -4h
## in.cooling_setpoint_offset_periodDay and Night Setup -5h      ***
## in.cooling_setpoint_offset_periodDay and Night Setup +1h      *
## in.cooling_setpoint_offset_periodDay and Night Setup +2h      ***
## in.cooling_setpoint_offset_periodDay and Night Setup +3h
## in.cooling_setpoint_offset_periodDay and Night Setup +4h      ***
## in.cooling_setpoint_offset_periodDay and Night Setup +5h      ***
## in.cooling_setpoint_offset_periodDay Setup
## in.cooling_setpoint_offset_periodDay Setup -1h
## in.cooling_setpoint_offset_periodDay Setup -2h
## in.cooling_setpoint_offset_periodDay Setup -3h
## in.cooling_setpoint_offset_periodDay Setup -4h      ***

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## in.cooling_setpoint_offset_periodDay Setup -5h
## in.cooling_setpoint_offset_periodDay Setup +1h
## in.cooling_setpoint_offset_periodDay Setup +2h
## in.cooling_setpoint_offset_periodDay Setup +3h
## in.cooling_setpoint_offset_periodDay Setup +4h
## in.cooling_setpoint_offset_periodDay Setup +5h
## in.cooling_setpoint_offset_periodDay Setup and Night Setback
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -1h
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -2h
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -3h
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -4h
## in.cooling_setpoint_offset_periodDay Setup and Night Setback -5h
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +1h
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +2h
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +3h
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +4h
## in.cooling_setpoint_offset_periodDay Setup and Night Setback +5h
## in.cooling_setpoint_offset_periodNight Setback
## in.cooling_setpoint_offset_periodNight Setback -1h
## in.cooling_setpoint_offset_periodNight Setback -2h
## in.cooling_setpoint_offset_periodNight Setback -3h
## in.cooling_setpoint_offset_periodNight Setback -4h
## in.cooling_setpoint_offset_periodNight Setback -5h
## in.cooling_setpoint_offset_periodNight Setback +1h
## in.cooling_setpoint_offset_periodNight Setback +2h
## in.cooling_setpoint_offset_periodNight Setback +3h
## in.cooling_setpoint_offset_periodNight Setback +4h
## in.cooling_setpoint_offset_periodNight Setback +5h
## in.cooling_setpoint_offset_periodNight Setup
## in.cooling_setpoint_offset_periodNight Setup -1h
## in.cooling_setpoint_offset_periodNight Setup -2h
## in.cooling_setpoint_offset_periodNight Setup -3h
## in.cooling_setpoint_offset_periodNight Setup -4h
## in.cooling_setpoint_offset_periodNight Setup -5h
## in.cooling_setpoint_offset_periodNight Setup +1h
## in.cooling_setpoint_offset_periodNight Setup +2h
## in.cooling_setpoint_offset_periodNight Setup +3h
## in.cooling_setpoint_offset_periodNight Setup +4h
## in.cooling_setpoint_offset_periodNight Setup +5h
## in.cooling_setpoint_offset_periodNone
## in.county_and_pumaG4500030, G45001500
## in.county_and_pumaG4500050, G45001300
## in.county_and_pumaG4500070, G45000200
## in.county_and_pumaG4500090, G45001300
## in.county_and_pumaG4500110, G45001300
## in.county_and_pumaG4500130, G45001400
## in.county_and_pumaG4500150, G45001201
## in.county_and_pumaG4500150, G45001202
## in.county_and_pumaG4500150, G45001203
## in.county_and_pumaG4500150, G45001204
## in.county_and_pumaG4500170, G45000605
## in.county_and_pumaG4500190, G45001201
## in.county_and_pumaG4500190, G45001202
## in.county_and_pumaG4500190, G45001203
## in.county_and_pumaG4500190, G45001204
## in.county_and_pumaG4500210, G45000400

```

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## in.county_and_pumaG4500230, G45000400
## in.county_and_pumaG4500250, G45000700
## in.county_and_pumaG4500270, G45000800
## in.county_and_pumaG4500290, G45001300
## in.county_and_pumaG4500310, G45000900
## in.county_and_pumaG4500330, G45001000
## in.county_and_pumaG4500350, G45001201
## in.county_and_pumaG4500350, G45001204
## in.county_and_pumaG4500370, G45001500
## in.county_and_pumaG4500390, G45000603
## in.county_and_pumaG4500410, G45000900
## in.county_and_pumaG4500430, G45001000
## in.county_and_pumaG4500450, G45000102
## in.county_and_pumaG4500450, G45000103 ***

## in.county_and_pumaG4500450, G45000104 ***
## in.county_and_pumaG4500450, G45000105
## in.county_and_pumaG4500470, G45001600
## in.county_and_pumaG4500490, G45001300
## in.county_and_pumaG4500510, G45001101 ***
## in.county_and_pumaG4500510, G45001102
## in.county_and_pumaG4500530, G45001400
## in.county_and_pumaG4500550, G45000605
## in.county_and_pumaG4500570, G45000700
## in.county_and_pumaG4500590, G45000105
## in.county_and_pumaG4500610, G45000800
## in.county_and_pumaG4500630, G45000601
## in.county_and_pumaG4500630, G45000602
## in.county_and_pumaG4500650, G45001600
## in.county_and_pumaG4500670, G45001000
## in.county_and_pumaG4500690, G45000700
## in.county_and_pumaG4500710, G45000400
## in.county_and_pumaG4500730, G45000101
## in.county_and_pumaG4500750, G45001300
## in.county_and_pumaG4500770, G45000101
## in.county_and_pumaG4500790, G45000603 ***

## in.county_and_pumaG4500790, G45000604 ***
## in.county_and_pumaG4500790, G45000605
## in.county_and_pumaG4500810, G45000601
## in.county_and_pumaG4500830, G45000301
## in.county_and_pumaG4500830, G45000302
## in.county_and_pumaG4500850, G45000800
## in.county_and_pumaG4500870, G45000400
## in.county_and_pumaG4500890, G45000800
## in.county_and_pumaG4500910, G45000501
## in.county_and_pumaG4500910, G45000502
## in.dishwasher290 Rated kWh, 120% Usage *
## in.dishwasher290 Rated kWh, 80% Usage
## in.dishwasher318 Rated kWh, 100% Usage
## in.dishwasher318 Rated kWh, 120% Usage ***

## in.dishwasher318 Rated kWh, 80% Usage *
## in.dishwasherNone ***
## in.ducts10% Leakage, R-4 ***
## in.ducts10% Leakage, R-6 ***
## in.ducts10% Leakage, R-8 ***
## in.ducts10% Leakage, Uninsulated **
## in.ducts20% Leakage, R-4 ***

```

```

## in.ducts20% Leakage, R-6                         ***
## in.ducts20% Leakage, R-8                         ***
## in.ducts20% Leakage, Uninsulated                **
## in.ducts30% Leakage, R-4                         ***
## in.ducts30% Leakage, R-6                         ***
## in.ducts30% Leakage, R-8                         ***
## in.ducts30% Leakage, Uninsulated                ***
## in.ductsNone                                     *
## in.federal_poverty_level100-150%                ***
## in.federal_poverty_level150-200%                ***
## in.federal_poverty_level200-300%                ***
## in.federal_poverty_level300-400%                ***
## in.federal_poverty_level400%+                   ***
## in.geometry_attic_typeVented Attic              ***
## in.geometry_floor_area1000-1499                 ***
## in.geometry_floor_area1500-1999                 ***
## in.geometry_floor_area2000-2499                 ***
## in.geometry_floor_area2500-2999                 ***
## in.geometry_floor_area3000-3999                 ***
## in.geometry_floor_area4000+                     ***
## in.geometry_floor_area500-749                  ***
## in.geometry_floor_area750-999                  ***
## in.geometry_floor_area_bin1500-2499             ***
## in.geometry_floor_area_bin2500-3999             ***
## in.geometry_floor_area_bin4000+                  ***
## in.geometry_foundation_typeHeated Basement     ***
## in.geometry_foundation_typeSlab                ***
## in.geometry_foundation_typeUnheated Basement   ***
## in.geometry_foundation_typeUnvented Crawlspace *
## in.geometry_foundation_typeVented Crawlspace   **
## in.geometry_garage                                ***
## in.geometry_stories                             ***
## in.geometry_stories_low_rise                    *
## in.geometry_wall_exterior_finishBrick, Light    *
## in.geometry_wall_exterior_finishBrick, Medium/Dark *
## in.geometry_wall_exterior_finishFiber-Cement, Light .
## in.geometry_wall_exterior_finishNone            **
## in.geometry_wall_exterior_finishShingle, Asbestos, Medium **
## in.geometry_wall_exterior_finishShingle, Composition, Medium *
## in.geometry_wall_exterior_finishStucco, Light    *
## in.geometry_wall_exterior_finishVinyl, Light    *
## in.geometry_wall_exterior_finishWood, Medium/Dark *
## in.geometry_wall_typeConcrete                   ***
## in.geometry_wall_typeSteel Frame               *
## in.geometry_wall_typeWood Frame                **
## in.has_pvYes                                    **
## in.heating_fuelFuel Oil                        ***
## in.heating_fuelNatural Gas                     ***
## in.heating_fuelNone                           *
## in.heating_fuelOther Fuel                      ***
## in.heating_fuelPropane                         ***
## in.heating_setpoint                           ***
## in.heating_setpoint_has_offsetYes             *
## in.heating_setpoint_offset_magnitude        ***
## in.heating_setpoint_offset_periodDay -1h      ***
## in.heating_setpoint_offset_periodDay -2h      ***

```

```

## in.heating_setpoint_offset_periodDay -3h ***.
## in.heating_setpoint_offset_periodDay -4h .
## in.heating_setpoint_offset_periodDay -5h ***
## in.heating_setpoint_offset_periodDay +1h .
## in.heating_setpoint_offset_periodDay +2h ***
## in.heating_setpoint_offset_periodDay +3h .
## in.heating_setpoint_offset_periodDay +4h ***
## in.heating_setpoint_offset_periodDay +5h .
## in.heating_setpoint_offset_periodDay and Night ***.
## in.heating_setpoint_offset_periodDay and Night -1h .
## in.heating_setpoint_offset_periodDay and Night -2h ***
## in.heating_setpoint_offset_periodDay and Night -3h .
## in.heating_setpoint_offset_periodDay and Night -4h .
## in.heating_setpoint_offset_periodDay and Night -5h .
## in.heating_setpoint_offset_periodDay and Night +1h ***.
## in.heating_setpoint_offset_periodDay and Night +2h .
## in.heating_setpoint_offset_periodDay and Night +3h ***.
## in.heating_setpoint_offset_periodDay and Night +4h .
## in.heating_setpoint_offset_periodDay and Night +5h ***.
## in.heating_setpoint_offset_periodNight ***.
## in.heating_setpoint_offset_periodNight -1h .
## in.heating_setpoint_offset_periodNight -2h ***.
## in.heating_setpoint_offset_periodNight -3h .
## in.heating_setpoint_offset_periodNight -4h **.
## in.heating_setpoint_offset_periodNight -5h .
## in.heating_setpoint_offset_periodNight +1h **.
## in.heating_setpoint_offset_periodNight +2h .
## in.heating_setpoint_offset_periodNight +3h *.
## in.heating_setpoint_offset_periodNight +4h *.
## in.heating_setpoint_offset_periodNight +5h *.
## in.heating_setpoint_offset_periodNone ***.
## in.hot_water_fixtures20% Usage ***.
## in.hot_water_fixtures50% Usage ***.
## in.hvac_cooling_efficiencyAC, SEER 13 .
## in.hvac_cooling_efficiencyAC, SEER 15 .
## in.hvac_cooling_efficiencyAC, SEER 8 .
## in.hvac_cooling_efficiencyHeat Pump *.
## in.hvac_cooling_efficiencyNone ***.
## in.hvac_cooling_efficiencyRoom AC, EER 10.7 .
## in.hvac_cooling_efficiencyRoom AC, EER 12.0 *.
## in.hvac_cooling_efficiencyRoom AC, EER 8.5 ***.
## in.hvac_cooling_efficiencyRoom AC, EER 9.8 .
## in.hvac_cooling_partial_space_conditioning20% Conditioned **.
## in.hvac_cooling_partial_space_conditioning40% Conditioned ***.
## in.hvac_cooling_partial_space_conditioning60% Conditioned .
## in.hvac_cooling_partial_space_conditioning80% Conditioned **.
## in.hvac_cooling_partial_space_conditioningNone .
## in.hvac_cooling_typeHeat Pump .
## in.hvac_cooling_typeNone .
## in.hvac_cooling_typeRoom AC .
## in.hvac_has_ductsYes .
## in.hvac_has_zonal_electric_heatingYes ***.
## in.hvac_heating_efficiencyASHP, SEER 13, 7.7 HSPF ***.
## in.hvac_heating_efficiencyASHP, SEER 15, 8.5 HSPF ***.
## in.hvac_heating_efficiencyElectric Baseboard, 100% Efficiency .
## in.hvac_heating_efficiencyElectric Boiler, 100% AFUE ***.

```

```

## in.hvac_heating_efficiencyElectric Furnace, 100% AFUE
## in.hvac_heating_efficiencyElectric Wall Furnace, 100% AFUE
## in.hvac_heating_efficiencyFuel Boiler, 76% AFUE *** 
## in.hvac_heating_efficiencyFuel Boiler, 80% AFUE ***
## in.hvac_heating_efficiencyFuel Boiler, 90% AFUE *
## in.hvac_heating_efficiencyFuel Furnace, 60% AFUE **
## in.hvac_heating_efficiencyFuel Furnace, 76% AFUE
## in.hvac_heating_efficiencyFuel Furnace, 80% AFUE
## in.hvac_heating_efficiencyFuel Furnace, 92.5% AFUE
## in.hvac_heating_efficiencyFuel Wall/Floor Furnace, 60% AFUE ** 
## in.hvac_heating_efficiencyFuel Wall/Floor Furnace, 68% AFUE
## in.hvac_heating_efficiencyNone
## in.hvac_heating_efficiencyOther
## in.hvac_heating_typeDucted Heating *
## in.hvac_heating_typeNon-Ducted Heating
## in.hvac_heating_typeNone
## in.hvac_heating_type_and_fuelElectricity Baseboard
## in.hvac_heating_type_and_fuelElectricity Electric Boiler
## in.hvac_heating_type_and_fuelElectricity Electric Furnace
## in.hvac_heating_type_and_fuelElectricity Electric Wall Furnace
## in.hvac_heating_type_and_fuelFuel Oil Fuel Boiler
## in.hvac_heating_type_and_fuelFuel Oil Fuel Furnace
## in.hvac_heating_type_and_fuelFuel Oil Fuel Wall/Floor Furnace
## in.hvac_heating_type_and_fuelNatural Gas Fuel Boiler *** 
## in.hvac_heating_type_and_fuelNatural Gas Fuel Furnace ***
## in.hvac_heating_type_and_fuelNatural Gas Fuel Wall/Floor Furnace
## in.hvac_heating_type_and_fuelNone
## in.hvac_heating_type_and_fuelPropane Fuel Boiler
## in.hvac_heating_type_and_fuelPropane Fuel Furnace
## in.hvac_heating_type_and_fuelPropane Fuel Wall/Floor Furnace
## in.income *** 
## in.income_recs_2015 ***
## in.income_recs_2020 **
## in.infiltration ***
## in.insulation_ceilingR-13
## in.insulation_ceilingR-19 **
## in.insulation_ceilingR-30
## in.insulation_ceilingR-38
## in.insulation_ceilingR-49 ***
## in.insulation_ceilingR-7 ***
## in.insulation_ceilingUninsulated
## in.insulation_floorCeiling R-19 *
## in.insulation_floorNone
## in.insulation_floorUninsulated ***
## in.insulation.foundation_wallUninsulated ***
## in.insulation.foundation_wallWall R-10, Exterior
## in.insulation.foundation_wallWall R-15, Exterior *
## in.insulation.foundation_wallWall R-5, Exterior
## in.insulation_rim_joistR-10, Exterior
## in.insulation_rim_joistR-15, Exterior
## in.insulation_rim_joistR-5, Exterior
## in.insulation_rim_joistUninsulated
## in.insulation_roofFinished, R-19
## in.insulation_roofFinished, R-30 ***
## in.insulation_roofFinished, R-38
## in.insulation_roofFinished, R-49

```

```

## in.insulation_roofFinished, R-7                                **
## in.insulation_roofFinished, Uninsulated                         *
## in.insulation_roofUnfinished, Uninsulated
## in.insulation_slab2ft R10 Under, Horizontal
## in.insulation_slab2ft R5 Perimeter, Vertical
## in.insulation_slab2ft R5 Under, Horizontal                      **
## in.insulation_slabNone
## in.insulation_slabUninsulated                                 ***
## in.insulation_wallBrick, 12-in, 3-wythe, R-15                 ***
## in.insulation_wallBrick, 12-in, 3-wythe, R-19
## in.insulation_wallBrick, 12-in, 3-wythe, R-7                  ***
## in.insulation_wallBrick, 12-in, 3-wythe, Uninsulated          ***
## in.insulation_wallCMU, 6-in Hollow, R-11                      ***
## in.insulation_wallCMU, 6-in Hollow, R-15                      ***
## in.insulation_wallCMU, 6-in Hollow, R-19                      ***
## in.insulation_wallCMU, 6-in Hollow, R-7
## in.insulation_wallCMU, 6-in Hollow, Uninsulated
## in.insulation_wallWood Stud, R-11
## in.insulation_wallWood Stud, R-15
## in.insulation_wallWood Stud, R-19                            **
## in.insulation_wallWood Stud, R-7                             ***
## in.insulation_wallWood Stud, Uninsulated                     ***
## in.lighting100% Incandescent                               ***
## in.lighting100% LED                                       ***
## in.misc_extra_refrigeratorEF 10.5                           *
## in.misc_extra_refrigeratorEF 15.9                          ***
## in.misc_extra_refrigeratorEF 17.6                          ***
## in.misc_extra_refrigeratorEF 19.9                          **
## in.misc_extra_refrigeratorEF 6.7                           ***
## in.misc_extra_refrigeratorNone                         ***
## in.misc_freezerNone                                     ***
## in.misc_gas_fireplaceNone                         ***
## in.misc_gas_grillNone                                    ***
## in.misc_gas_lightingNone                                ***
## in.misc_hot_tub_spagas                                ***
## in.misc_hot_tub_spNone                                  ***
## in.misc_poolNone                                     ***
## in.misc_pool_heaterGas                                ***
## in.misc_pool_heaterNone                                ***
## in.misc_pool_heaterSolar                                ***
## in.misc_pool_pumpNone                                 ***
## in.misc_well_pumpTypical Efficiency                   ***
## in.occupants10+                                      ***
## in.occupants2                                       ***
## in.occupants3                                     ***
## in.occupants4                                     ***
## in.occupants5                                     ***
## in.occupants6                                     ***
## in.occupants7                                     ***
## in.occupants8                                     ***
## in.occupants9                                     ***
## in.orientationNorth                                ***
## in.orientationNortheast                            ***
## in.orientationNorthwest                            ***
## in.orientationSouth                                ***
## in.orientationSoutheast                            **

```

```
## in.orientationSouthwest
## in.orientationWest
## in.plug_load_diversity200%
## in.plug_load_diversity50%
## in.pumaG45000102
## in.pumaG45000103
## in.pumaG45000104
## in.pumaG45000105
## in.pumaG45000200
## in.pumaG45000301
## in.pumaG45000302
## in.pumaG45000400
## in.pumaG45000501
## in.pumaG45000502
## in.pumaG45000601
## in.pumaG45000602
## in.pumaG45000603
## in.pumaG45000604
## in.pumaG45000605
## in.pumaG45000700
## in.pumaG45000800
## in.pumaG45000900
## in.pumaG45001000
## in.pumaG45001101
## in.pumaG45001102
## in.pumaG45001201
## in.pumaG45001202
## in.pumaG45001203
## in.pumaG45001204
## in.pumaG45001300
## in.pumaG45001400
## in.pumaG45001500
## in.pumaG45001600
## in.puma_metro_statusNot/partially in metro area
## in.pv_orientationNone
## in.pv_orientationNorth
## in.pv_orientationSouth
## in.pv_orientationSoutheast
## in.pv_orientationSouthwest
## in.pv_orientationWest
## in.pv_system_size11.0 kWDC
## in.pv_system_size13.0 kWDC
## in.pv_system_size3.0 kWDC
## in.pv_system_size5.0 kWDC
## in.pv_system_size7.0 kWDC
## in.pv_system_size9.0 kWDC
## in.pv_system_sizeNone
## in.range_spot_vent_hour
## in.reeds_balancing_area
## in.refrigeratorEF 10.5, 100% Usage
## in.refrigeratorEF 15.9, 100% Usage
## in.refrigeratorEF 17.6, 100% Usage
## in.refrigeratorEF 19.9, 100% Usage
## in.refrigeratorEF 6.7, 100% Usage
## in.refrigeratorNone
## in.roof_materialComposition Shingles
```

```

## in.roof_materialMetal, Dark
## in.roof_materialSlate
## in.roof_materialTile, Clay or Ceramic
## in.roof_materialTile, Concrete
## in.roof_materialWood Shingles
## in.tenureRenter
## in.usage_levelLow
## in.usage_levelMedium
## in.vacancy_statusVacant
## in.vintage1940s
## in.vintage1950s
## in.vintage1960s
## in.vintage1970s
## in.vintage1980s
## in.vintage1990s
## in.vintage2000s
## in.vintage2010s
## in.vintage_acs1940-59
## in.vintage_acs1960-79
## in.vintage_acs1980-99
## in.vintage_acs2000-09
## in.vintage_acs2010s
## in.water_heater_efficiencyElectric Premium
## in.water_heater_efficiencyElectric Standard
## in.water_heater_efficiencyElectric Tankless
## in.water_heater_efficiencyFuel Oil Standard
## in.water_heater_efficiencyNatural Gas Premium
## in.water_heater_efficiencyNatural Gas Standard
## in.water_heater_efficiencyNatural Gas Tankless
## in.water_heater_efficiencyOther Fuel
## in.water_heater_efficiencyPropane Premium
## in.water_heater_efficiencyPropane Standard
## in.water_heater_efficiencyPropane Tankless
## in.water_heater_fuelFuel Oil
## in.water_heater_fuelNatural Gas
## in.water_heater_fuelOther Fuel
## in.water_heater_fuelPropane
## in.weather_file_cityAugusta Bush Field
## in.weather_file_cityBeaufort Mcas
## in.weather_file_cityCharleston Muni
## in.weather_file_cityColumbia Metro
## in.weather_file_cityColumbia Owenses Apt
## in.weather_file_cityDaniel Field
## in.weather_file_cityFlorence Rgnl
## in.weather_file_cityGreenville Greenvil
## in.weather_file_cityGreenwood Co
## in.weather_file_cityMaxton
## in.weather_file_cityMonroe Airport
## in.weather_file_cityMyrtle Beach Civ
## in.weather_file_cityOconee Co Rgnl
## in.weather_file_cityOrangeburg Muni
## in.weather_file_cityRock Hill York Co
## in.weather_file_cityRutherfordton
## in.weather_file_cityShaw Afb Sumter
## in.weather_file_latitude
## in.weather_file_longitude

```

```

## in.window_areasF15 B15 L15 R15 ***  

## in.window_areasF18 B18 L18 R18 ***  

## in.window_areasF30 B30 L30 R30 ***  

## in.window_areasF6 B6 L6 R6 ***  

## in.window_areasF9 B9 L9 R9 ***  

## in.windowsDouble, Clear, Metal, Air, Exterior Clear Storm ***  

## in.windowsDouble, Clear, Non-metal, Air ***  

## in.windowsDouble, Clear, Non-metal, Air, Exterior Clear Storm ***  

## in.windowsDouble, Low-E, Non-metal, Air, M-Gain ***  

## in.windowsSingle, Clear, Metal ***  

## in.windowsSingle, Clear, Metal, Exterior Clear Storm ***  

## in.windowsSingle, Clear, Non-metal ***  

## in.windowsSingle, Clear, Non-metal, Exterior Clear Storm ***  

## in.windowsTriple, Low-E, Non-metal, Air, L-Gain ***  

## upgrade.insulation_roofFinished, R-30  

## upgrade.water_heater_efficiencyElectric Heat Pump, 50 gal, 3.45 UEF  

## upgrade.water_heater_efficiencyElectric Heat Pump, 66 gal, 3.35 UEF  

## upgrade.water_heater_efficiencyElectric Heat Pump, 80 gal, 3.45 UEF  

## upgrade.infiltration_reduction30%  

## upgrade.geometry.foundation_typeUnvented Crawlspace  

## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 100% Usage  

## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 120% Usage  

## upgrade.clothes_dryerElectric, Premium, Heat Pump, Ventless, 80% Usage  

## upgrade.insulation_ceilingR-49  

## upgrade.ducts10% Leakage, R-8  

## upgrade.hvac_heating_typeDucted Heat Pump  

## upgrade.insulation_wallWood Stud, R-13  

## upgrade.insulation.foundation_wallWall R-10, Interior ***  

## upgrade.hvac_heating_efficiencyMSHP, SEER 29.3, 14 HSPF, Max Load  

## upgrade.cooking_rangeElectric, Induction, 100% Usage  

## upgrade.cooking_rangeElectric, Induction, 120% Usage  

## upgrade.cooking_rangeElectric, Induction, 80% Usage  

## county_idG4500030  

## county_idG4500050  

## county_idG4500070  

## county_idG4500090  

## county_idG4500110  

## county_idG4500130  

## county_idG4500150  

## county_idG4500170  

## county_idG4500190  

## county_idG4500210  

## county_idG4500230  

## county_idG4500250  

## county_idG4500270  

## county_idG4500290  

## county_idG4500310  

## county_idG4500330  

## county_idG4500350  

## county_idG4500370  

## county_idG4500390  

## county_idG4500410  

## county_idG4500430  

## county_idG4500450  

## county_idG4500470  

## county_idG4500490

```

```
## county_idG4500510
## county_idG4500530
## county_idG4500550
## county_idG4500570
## county_idG4500590
## county_idG4500610
## county_idG4500630
## county_idG4500650
## county_idG4500670
## county_idG4500690
## county_idG4500710
## county_idG4500730
## county_idG4500750
## county_idG4500770
## county_idG4500790
## county_idG4500810
## county_idG4500830
## county_idG4500850
## county_idG4500870
## county_idG4500890
## county_idG4500910
## date_time2018-07-02
## date_time2018-07-03
## date_time2018-07-04
## date_time2018-07-05
## date_time2018-07-06
## date_time2018-07-07
## date_time2018-07-08
## date_time2018-07-09
## date_time2018-07-10
## date_time2018-07-11
## date_time2018-07-12
## date_time2018-07-13
## date_time2018-07-14
## date_time2018-07-15
## date_time2018-07-16
## date_time2018-07-17
## date_time2018-07-18
## date_time2018-07-19
## date_time2018-07-20
## date_time2018-07-21
## date_time2018-07-22
## date_time2018-07-23
## date_time2018-07-24
## date_time2018-07-25
## date_time2018-07-26
## date_time2018-07-27
## date_time2018-07-28
## date_time2018-07-29
## date_time2018-07-30
## date_time2018-07-31
## Direct_Normal_Radiation *
## Diffuse_Horizontal_Radiation **
## Dry_Bulb_Temperature ***
## Relative_Humidity ***
## Wind_Speed ***
```

```
## Wind_Direction
## Global_Horizontal_Radiation
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 4.569 on 141147 degrees of freedom
## Multiple R-squared:  0.8821, Adjusted R-squared:  0.8817
## F-statistic:  2290 on 461 and 141147 DF,  p-value: < 2.2e-16
```

```
# Predict total energy values for test data
predicted_values <- predict(lmout, newdata = test_data)
```

```
## Warning in predict.lm(lmout, newdata = test_data): prediction from a
## rank-deficient fit may be misleading
```

```
# These are the actual total energy values of test data
actual_values <- test_data$total_energy
```

```
# Obtain the R-Squared error.
R_squared <- 1 - (sum((actual_values - predicted_values)^2) / sum((actual_values - mean(actual_values))^2))

cat("R-squared (R2):", R_squared, "\n")
```

```
## R-squared (R2): 0.880862
```

```
cat("Accuracy of Linear regression model is : ", R_squared * 100, "\n")
```

```
## Accuracy of Linear regression model is :  88.0862
```

2. XG BOOST

```
# Build XG BOOST model to predict the total energy values.
```

```
#install.packages('xgboost')
library(xgboost)
```

```
##
## Attaching package: 'xgboost'
```

```
## The following object is masked from 'package:dplyr':
##     slice
```

```
library(dplyr)

# Building the model
model_xgb <- xgboost(
  data = as.matrix(train_data[, -which(names(train_data) == "total_energy")]) %>% select_if(is.numeric),
  label = train_data$total_energy,
  objective = "reg:squarederror", # Use squared error for regression
  nrounds = 100 # Adjust the number of boosting rounds
)
```

```
## [1] train-rmse:23.737860
## [2] train-rmse:17.785147
## [3] train-rmse:13.924354
## [4] train-rmse:11.506688
## [5] train-rmse:10.070859
## [6] train-rmse:9.244883
## [7] train-rmse:8.767398
## [8] train-rmse:8.496130
## [9] train-rmse:8.311471
## [10] train-rmse:8.190425
## [11] train-rmse:8.088351
## [12] train-rmse:8.041101
## [13] train-rmse:7.970217
## [14] train-rmse:7.871875
## [15] train-rmse:7.822688
## [16] train-rmse:7.790201
## [17] train-rmse:7.749859
## [18] train-rmse:7.679489
## [19] train-rmse:7.629778
## [20] train-rmse:7.610424
## [21] train-rmse:7.557251
## [22] train-rmse:7.537248
## [23] train-rmse:7.524055
## [24] train-rmse:7.506335
## [25] train-rmse:7.418008
## [26] train-rmse:7.351857
## [27] train-rmse:7.331665
## [28] train-rmse:7.307531
## [29] train-rmse:7.272955
## [30] train-rmse:7.216545
## [31] train-rmse:7.134557
## [32] train-rmse:7.124786
## [33] train-rmse:7.084393
## [34] train-rmse:7.047358
## [35] train-rmse:7.003644
## [36] train-rmse:6.957746
## [37] train-rmse:6.915954
## [38] train-rmse:6.892297
## [39] train-rmse:6.874402
## [40] train-rmse:6.868422
## [41] train-rmse:6.854497
## [42] train-rmse:6.825276
## [43] train-rmse:6.786699
## [44] train-rmse:6.729497
## [45] train-rmse:6.674338
## [46] train-rmse:6.651350
## [47] train-rmse:6.591961
## [48] train-rmse:6.555754
## [49] train-rmse:6.518915
## [50] train-rmse:6.457598
## [51] train-rmse:6.427502
## [52] train-rmse:6.407779
## [53] train-rmse:6.403326
## [54] train-rmse:6.393287
## [55] train-rmse:6.377801
```

```

## [56] train-rmse:6.341387
## [57] train-rmse:6.301984
## [58] train-rmse:6.257582
## [59] train-rmse:6.236552
## [60] train-rmse:6.227038
## [61] train-rmse:6.189314
## [62] train-rmse:6.152277
## [63] train-rmse:6.099633
## [64] train-rmse:6.049071
## [65] train-rmse:6.012664
## [66] train-rmse:6.006929
## [67] train-rmse:5.963771
## [68] train-rmse:5.932606
## [69] train-rmse:5.892625
## [70] train-rmse:5.886907
## [71] train-rmse:5.861277
## [72] train-rmse:5.837318
## [73] train-rmse:5.806743
## [74] train-rmse:5.796786
## [75] train-rmse:5.793386
## [76] train-rmse:5.784035
## [77] train-rmse:5.769499
## [78] train-rmse:5.754725
## [79] train-rmse:5.735737
## [80] train-rmse:5.695880
## [81] train-rmse:5.664363
## [82] train-rmse:5.631087
## [83] train-rmse:5.574715
## [84] train-rmse:5.533571
## [85] train-rmse:5.511853
## [86] train-rmse:5.471290
## [87] train-rmse:5.453375
## [88] train-rmse:5.444208
## [89] train-rmse:5.439424
## [90] train-rmse:5.425024
## [91] train-rmse:5.411732
## [92] train-rmse:5.406507
## [93] train-rmse:5.369608
## [94] train-rmse:5.327720
## [95] train-rmse:5.293460
## [96] train-rmse:5.251239
## [97] train-rmse:5.228612
## [98] train-rmse:5.217733
## [99] train-rmse:5.180335
## [100]   train-rmse:5.138465

```

```

# Make predictions on the test set
predictions <- predict(model_xgb, as.matrix(test_data[, -which(names(test_data) == "total_energy")]) %>% select_if(is.numeric))

# Obtain the R-Squared error.
rsquared <- 1 - (sum((predictions - test_data$total_energy)^2) / sum((mean(test_data$total_energy) - test_data$total_energy)^2))
cat("R-squared:", rsquared, "\n")

```

```
## R-squared: 0.8404433
```

```
cat("Accuracy of XG BOOST model is : ", rsquared * 100, "\n")
```

```
## Accuracy of XG BOOST model is : 84.04433
```

3. XG BOOST - Using Hyperparameters

```
# Building model including hyperparameters Like depth of tree and Learning rate
```

```
xgb_model_2 <- xgboost(data = as.matrix(train_data[, -which(names(train_data) == "total_energy")]) %>% select_if(is.numeric)), label = train_data$total_energy, nrounds = 100, max_depth = 8, eta = 0.2, subsample = 0.7, colsample_bytree = 0.7)
```

```
## [1] train-rmse:26.792041
## [2] train-rmse:22.154212
## [3] train-rmse:18.611702
## [4] train-rmse:15.732054
## [5] train-rmse:13.475357
## [6] train-rmse:11.815775
## [7] train-rmse:10.558958
## [8] train-rmse:9.694120
## [9] train-rmse:9.066549
## [10] train-rmse:8.551534
## [11] train-rmse:8.212842
## [12] train-rmse:7.912374
## [13] train-rmse:7.660497
## [14] train-rmse:7.545802
## [15] train-rmse:7.424044
## [16] train-rmse:7.339090
## [17] train-rmse:7.228001
## [18] train-rmse:7.075732
## [19] train-rmse:7.006212
## [20] train-rmse:6.903999
## [21] train-rmse:6.842909
## [22] train-rmse:6.761109
## [23] train-rmse:6.738644
## [24] train-rmse:6.642620
## [25] train-rmse:6.565537
## [26] train-rmse:6.543184
## [27] train-rmse:6.506279
## [28] train-rmse:6.401143
## [29] train-rmse:6.332388
## [30] train-rmse:6.253356
## [31] train-rmse:6.237684
## [32] train-rmse:6.218448
## [33] train-rmse:6.198269
## [34] train-rmse:6.110566
## [35] train-rmse:6.102844
## [36] train-rmse:6.080538
## [37] train-rmse:6.017111
## [38] train-rmse:5.953310
## [39] train-rmse:5.906636
## [40] train-rmse:5.827861
## [41] train-rmse:5.799416
## [42] train-rmse:5.748975
## [43] train-rmse:5.740211
## [44] train-rmse:5.713346
## [45] train-rmse:5.629265
## [46] train-rmse:5.579177
## [47] train-rmse:5.562272
## [48] train-rmse:5.550414
## [49] train-rmse:5.506057
## [50] train-rmse:5.487525
## [51] train-rmse:5.478166
## [52] train-rmse:5.394336
## [53] train-rmse:5.378044
## [54] train-rmse:5.364797
## [55] train-rmse:5.312630
```

```
## [56] train-rmse:5.280080
## [57] train-rmse:5.269243
## [58] train-rmse:5.254504
## [59] train-rmse:5.181690
## [60] train-rmse:5.135194
## [61] train-rmse:5.107094
## [62] train-rmse:5.060289
## [63] train-rmse:5.019819
## [64] train-rmse:5.002458
## [65] train-rmse:4.993410
## [66] train-rmse:4.979035
## [67] train-rmse:4.944786
## [68] train-rmse:4.911088
## [69] train-rmse:4.886305
## [70] train-rmse:4.852841
## [71] train-rmse:4.809026
## [72] train-rmse:4.804975
## [73] train-rmse:4.784311
## [74] train-rmse:4.765853
## [75] train-rmse:4.750474
## [76] train-rmse:4.735665
## [77] train-rmse:4.688429
## [78] train-rmse:4.682294
## [79] train-rmse:4.665552
## [80] train-rmse:4.651120
## [81] train-rmse:4.633813
## [82] train-rmse:4.617880
## [83] train-rmse:4.600032
## [84] train-rmse:4.582231
## [85] train-rmse:4.572832
## [86] train-rmse:4.531047
## [87] train-rmse:4.514193
## [88] train-rmse:4.473476
## [89] train-rmse:4.437927
## [90] train-rmse:4.414023
## [91] train-rmse:4.393428
## [92] train-rmse:4.379694
## [93] train-rmse:4.348644
## [94] train-rmse:4.337025
## [95] train-rmse:4.327691
## [96] train-rmse:4.289195
## [97] train-rmse:4.255765
## [98] train-rmse:4.236481
## [99] train-rmse:4.203561
## [100]    train-rmse:4.183179
```

```
# These are the actual total energy values of test data
actual_values <- test_data$total_energy

# Make predictions using the LASSO model on the test data
predictions <- predict(xgb_model_2, as.matrix(test_data[, -which(names(test_data) == "total_energy")]) %>% select_if(is.numeric))

# Calculate R-squared
rsquared <- 1 - (sum((actual_values - predictions)^2) / sum((actual_values - mean(actual_values))^2))

cat("R-squared:", rsquared, "\n")
```

```
## R-squared: 0.8857607
```

```
cat("Accuracy of XG BOOST with hyperparameters model is : ", rsquared * 100, "\n")
```

```
## Accuracy of XG BOOST with hyperparameters model is : 88.57607
```

```
# Increase the temperatures with 5 degrees
new_final_df <- cleaned_final_df %>%
  mutate(Dry_Bulb_Temperature = Dry_Bulb_Temperature + 5)

# Predict the total energy using the best working model for the increased temperature
predicted_energy <- predict(xgb_model_2, as.matrix(new_final_df[, -which(names(new_final_df) == "total_energy")]) %>% select_if(is.numeric)))

# Storing newly predicted total energy into new_total_energy column.
new_final_df$new_total_energy <- predicted_energy

write.csv(new_final_df , 'C:/Ramya/Syracuse/IDS/Final Project/predicted_df.csv')
```