Electricity Consumption in the United States. (2009)
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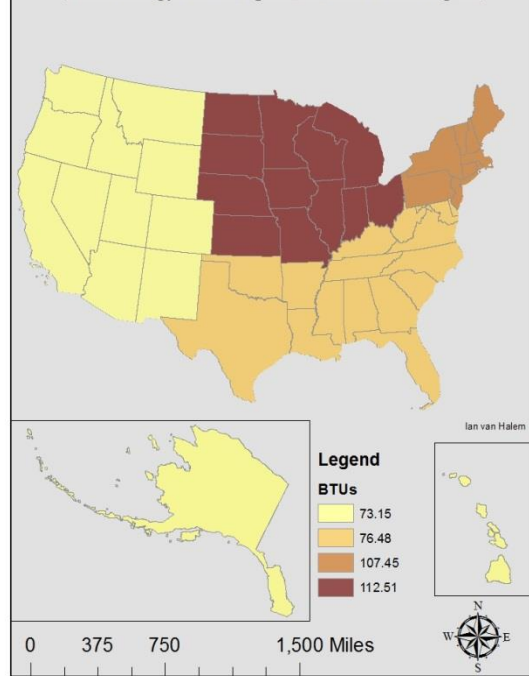
Abstract

In recent years the digital phenomena has swept our nation. Everything that we do involves electricity, from heating our homes to charging our phones. A large portion of our resources go towards creating electricity so that we can continue to enjoy this way of life. As we continue to follow this trend, it is important to understand how we are sustaining this lifestyle. This research project analyzed data from the Residential Energy Consumption Survey (RECS), a survey that has been collected by the United States' Census Bureau. The RECS's data is at the state level scale, and that is the scale in which this research project has been conducted. Electricity consumption evaluated alongside factors such as: median household income, age of householder, and household size. I found that that none of these factors had a significant influence on energy consumption across the country.

sub-regions that were analyzed.

Map 1

Total Energy Consumption of each U.S. Region

Legend — BTUs
- 73.15
- 76.48
- 107.45
- 112.51

0   375   750   1,500 Miles

Methodology
- Anova Test
  - total electricity consumption
  - Income
  - Age
- Pearsons R Test on Total Electricity consumption
  - Total electricity consumption
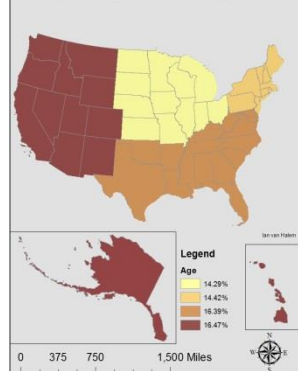 - Income
  - Age
  - Household size

Anova Test Results

		Sum of Squares	df	Mean Square	F	Sig.
TotalEnCon (million BTU) by housing units	Between Groups	2617.89	3	872.63	14.574	0.40%
	Within Groups	359.243	6	59.874		
	Total	2977.133	9			
Median HH Income	Between Groups	180892811	3	60297604	2.066	20.60%
	Within Groups	175117934	6	29186322		
	Total	356010745	9			
Percent of age 25-34	Between Groups	0.001	3	0	0.253	85.60%
	Within Groups	0.004	6	0.001		
	Total	0.005	9			
Percent of age 45-54	Between Groups	0	3	0	0.16	91.90%
	Within Groups	0.001	6	0		
	Total	0.001	9			
Percent of age 75 and up	Between Groups	0.001	3	0	0.676	59.80%
	Within Groups	0.003	6	0.001		
	Total	0.004	9			

Percentage of HH Under 1500 Sqft

Percentage of HH Between 1500-3500 Sqft


Percentage of HH 3500 Sqft and Up

Pearson R Test Results

Variable	Column1	TotalEnCon (million BTU) by housing units	Median HH income	Percent of age 25-34	Percent of age 75 and up
-Age	Pearson Correlation	1	.105	-.426	.199
	Sig. (2-tailed)		.772	.219	.582
Median HH Income	Pearson Correlation	.105	1	.005	-.369
	Sig. (2-tailed)	.772		.990	.294
Percent of age 25-34	Pearson Correlation	-.426	.005	1	-.461
	Sig. (2-tailed)	.219	.990		.180
Percent of age 75 and up	Pearson Correlation	.199	-.369	-.461	1
	Sig. (2-tailed)	.582	.294	.180	

Results

Total energy consumption is statistically significant, with energy consumption being much higher in the North and the Midwest (map 1), compared to the South and the West. The Anova tests found no statistically significant results between income and age categories, meaning that income and age did not affect energy consumption across the country; maps 2 and 3 show the variations between each variable across the different regions in the U.S. The Pearson's R test that we ran on the income and age categories found no statistical significance but found that the age group of 25-34 had a moderately negative effect on total energy consumption; the larger the group was the smaller amount of total energy was consumed.
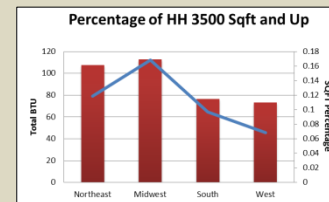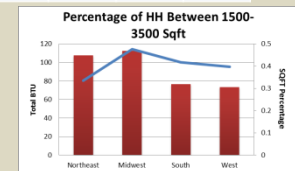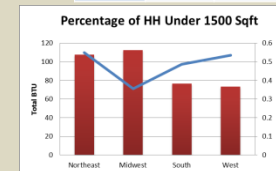
I was not able to run any test on the household size variable because there were not enough samples to return accurate results. So instead, I created a chart from the main data table to give an idea on how this variable and total energy consumption changes throughout each region.

Median Household Income Across U.S. Regions

Legend — Income
- $45,061.18
- $48,914.92
- $50,267.14
- $57,409.50

0   375   750   1,500 Miles

Map 2

Percentage of the Population between the Age of 25 and 34

Legend — Age
- 14.29%
- 14.42%
- 16.39%
- 16.47%

0   375   750   1,500 Miles

Map 3