

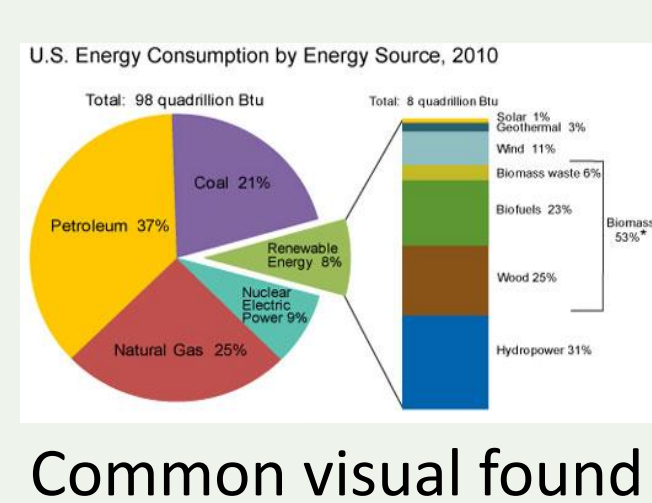
# U.S. Energy Usage and Predictions by Source and State

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## Introduction

### Current State

Lack of interactive visualization of energy trends



Common visual found

### Our Visual

Interactive map allows user to view:

- Past and current energy usage
- Predicted future use of energy
- Total amount of CO<sub>2</sub> emitted
- Energy policies enacted across years
- Easy identification of trends

### Importance

Effective way of measuring energy consumption across the US

Possibly stakeholders:

- Environmental Working Group (EWG)
- Environmental Protection Agency (EPA)

## Data



U.S. Environmental Protection Agency (EPA)

- Energy use by source
- Energy use by state
- Years 1960 – 2013



U.S. Information Administration (EIA)

- State population by year
- Carbon emissions per source
- Enacted environmental policies

## Methodology

### Clean data

- Google refine
- Excel

### Forecast future usage

- Used past 10 years
- Linear regression
- Python Panda library

### Merge data

- Combined historical and forecasted data

### Dynamic calculations

- Per capita energy use
- Total CO<sub>2</sub> emissions

### D3 visualization

- Topopjson
- Geomap (datamaps)
- CSS styling

## Experiment and Results

### Validation → How valid is our prediction model?

Tested regression prediction on the following years using data from 10 prior years

Year	1970	1980	1990	2000	Average
Delta	0.072	0.22	0.321	0.231	<b>0.211</b>

### Observation → What can we conclude about energy trends?

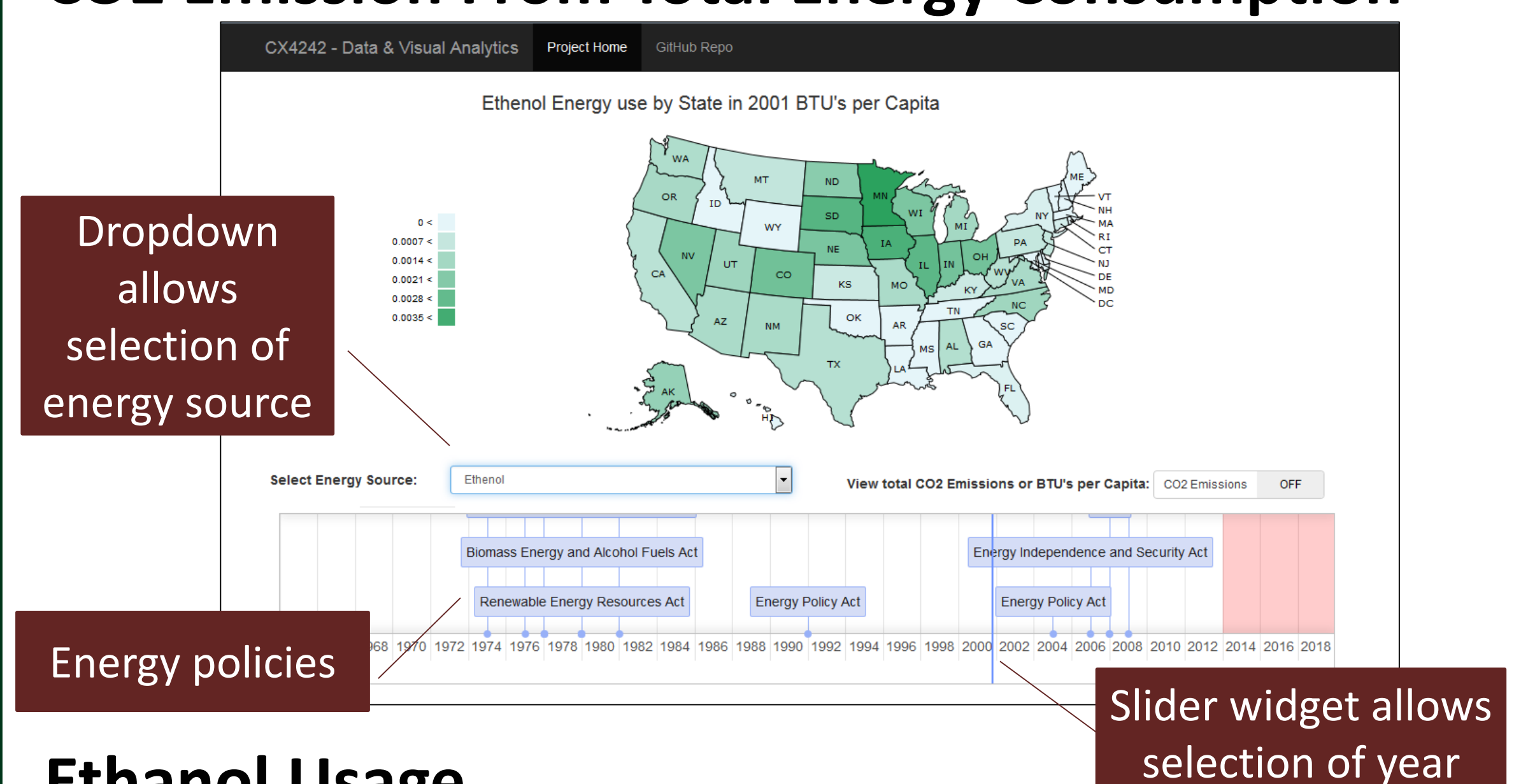
Energy Source	Observations
Biomass	Influx use in Midwest
Coal	Usage plateaued
Ethenol	Increased across US since 1980's
Geothermal	Heavy usage in west coast (tectonic plates)
Hydropower	Heavy reduction in Northwest
Natural Gas	Heavy usage of Natural Gas in Texas
Nuclear	Constant usage; difficult approval process
Petroleum	Same trends as Natural Gas
Solar	No usage until 1990's (Energy Policy Act)

### Conclusion

We are able to see greener energy trends in certain states; but visualizing the impact of energy policies was not effective.

## Interactive Map Visualization

### CO2 Emission From Total Energy Consumption



Dropdown allows selection of energy source

Energy policies

Slider widget allows selection of year

### Ethanol Usage

