

US Government Energy Consumption

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1 Qualitative Analysis of United States Historical Energy Consumption Data

Energy consumption is critical economic index and its impact is paramount as it is a major contributor to cost.

4 Department of Defense (DOD)

Analyzing energy consumption trends for DOD, highest contributor to United States energy consumption, we see a significant change in consumption trends with Electricity and Natural Gas gaining high share.

- OBJECTIVES**
1. To consolidate data sources to improve usability
 2. To identify historical trends in energy consumptions
 3. To analyze changing trend in use of energy sources
 4. To perform detailed analysis of departments

Our data is sourced from National Data Archives.

Conclusion

Our Analysis shows the principals of global economic trends, and their shift from reduced dependencies on traditional sources of fuel to more efficient and cheap energy sources.

1 Data Validation

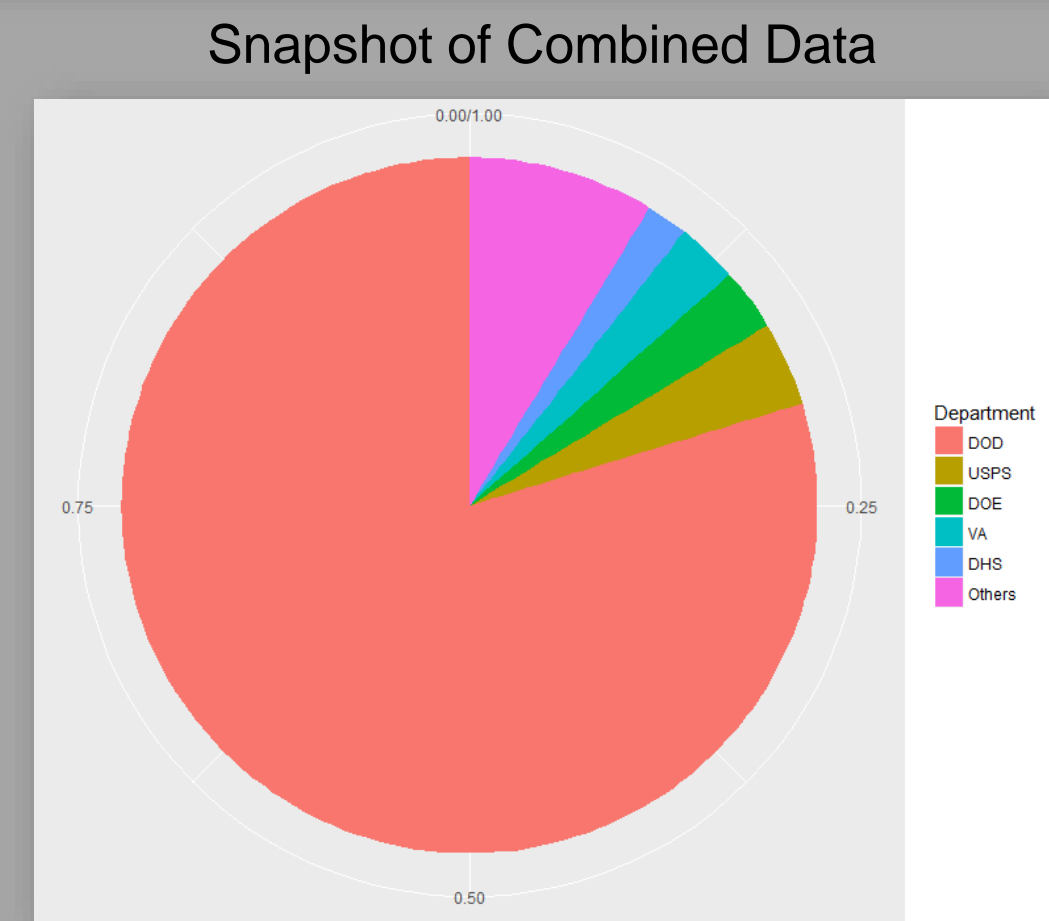
We combined and analyzed facility and mobility usage energy consumption and cost data from 53 US government departments from 1975 to 2012.

- Data Aggregation:**
- Import raw data of 53 government departments.
 - Import Commodity price index data for Crude Oil

- Data Transformation:**
- Modify data in R-Studio to make the data more readable
 - Test for data accuracy

- Data Segmentation:**
- Identify three departments with highest energy consumption
 - Analyze consumption trend from multiple energy sources

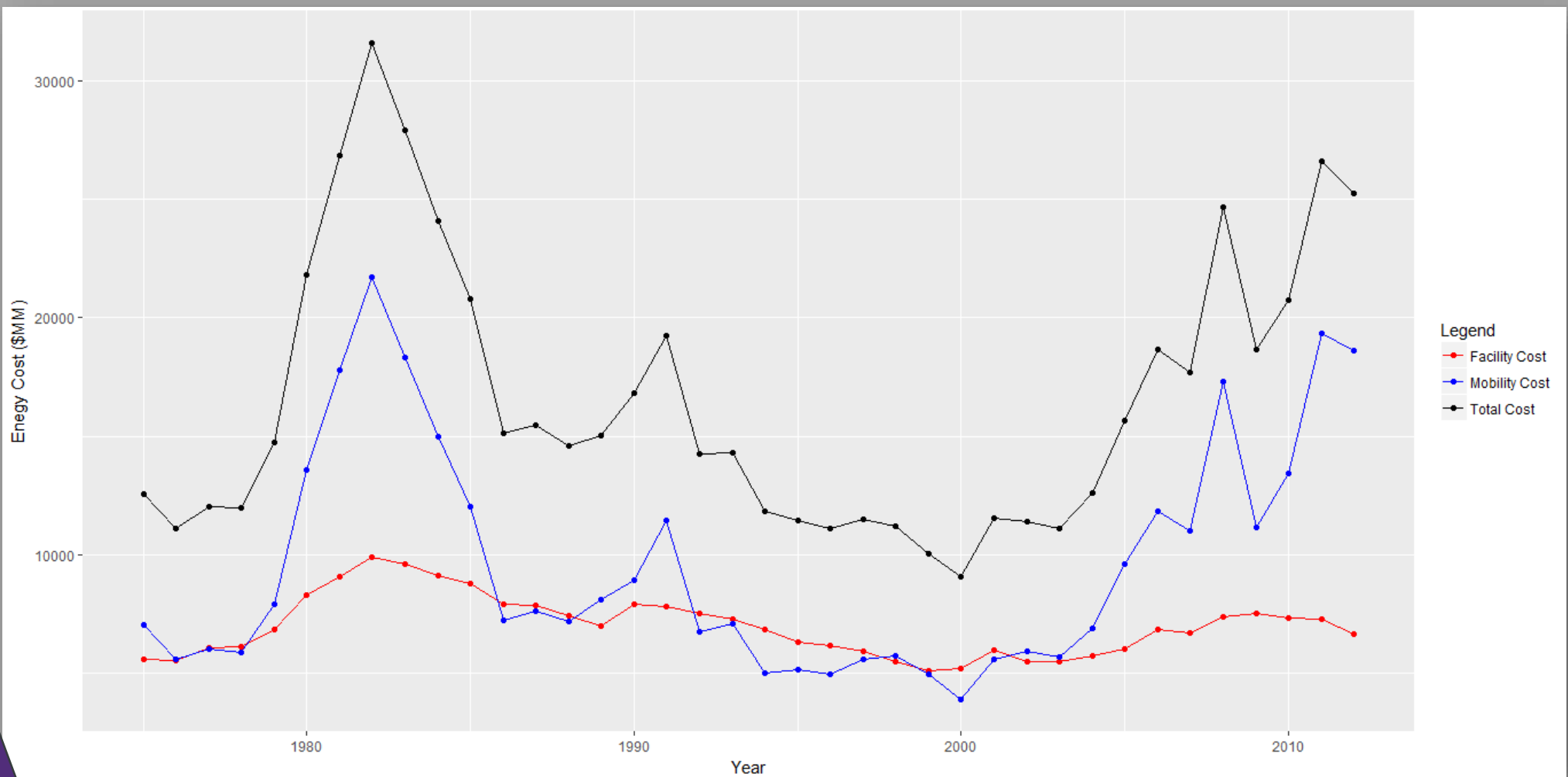
Year	Department	FUElectricity	FUFuel_Oil	FUNatural_Gas	FULPG/Propane	FUCoal
2007	DOD	101186.6	22752.8	69480.5	1344.3	15395.6
2008	DOD	102404.3	22805.0	68973.7	1275.3	15084.7
2009	DOD	101126.4	19088.2	74177.5	1417.4	16236.0
2010	DOD	102201.6	18477.1	72932.7	1516.4	15962.2
2011	DOD	102972.6	18881.7	68620.3	1227.7	14257.0
2012	DOD	101060.9	16124.6	63253.0	1010.8	13893.0



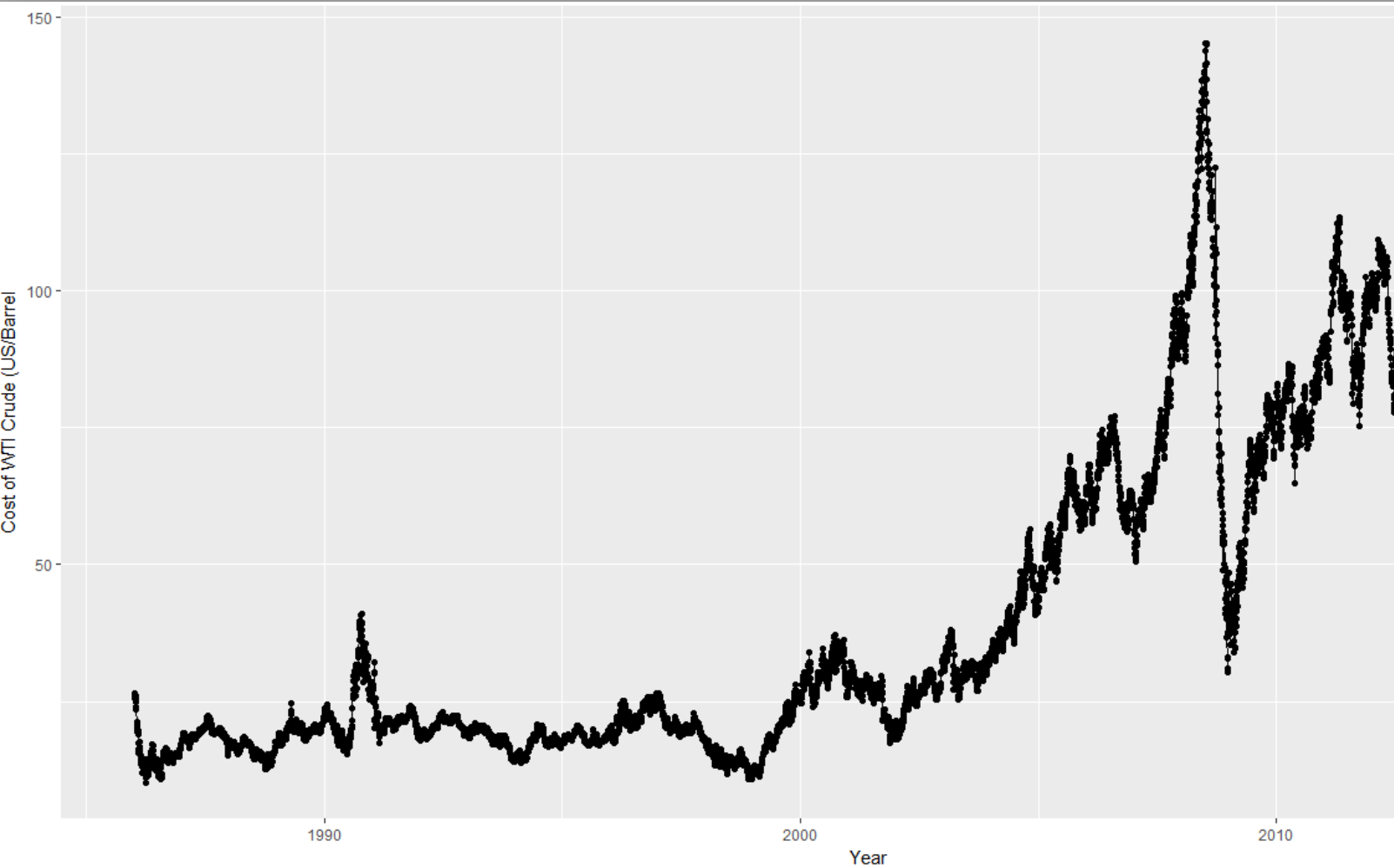
Facility Usage Consumption by Department

2 Macro Trend Analysis

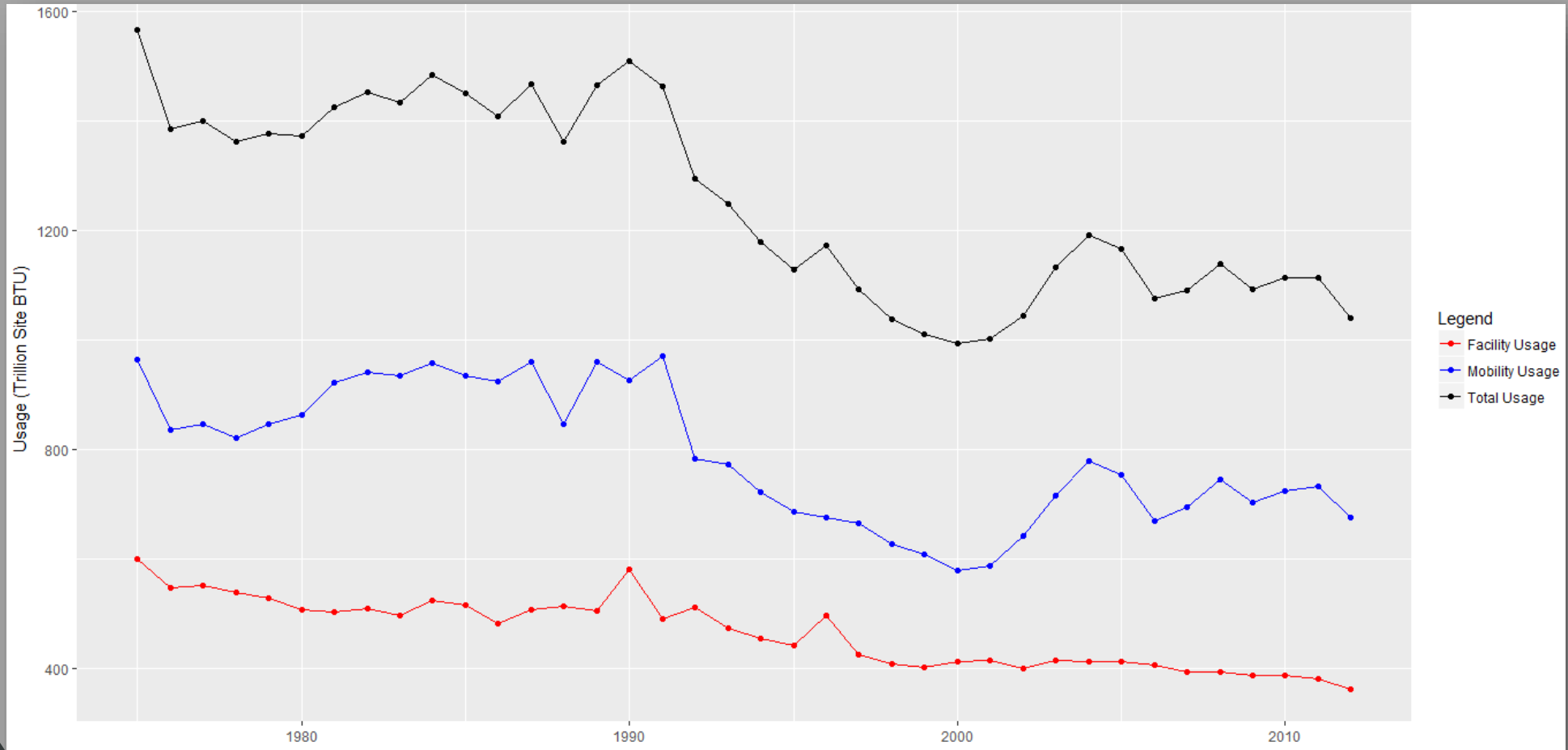
Analyzing energy consumption data over years and drawing a comparison with corresponding crude oil prices.



Historical Energy Costs in Millions of Dollars



Historical WTI crude commodity price Index

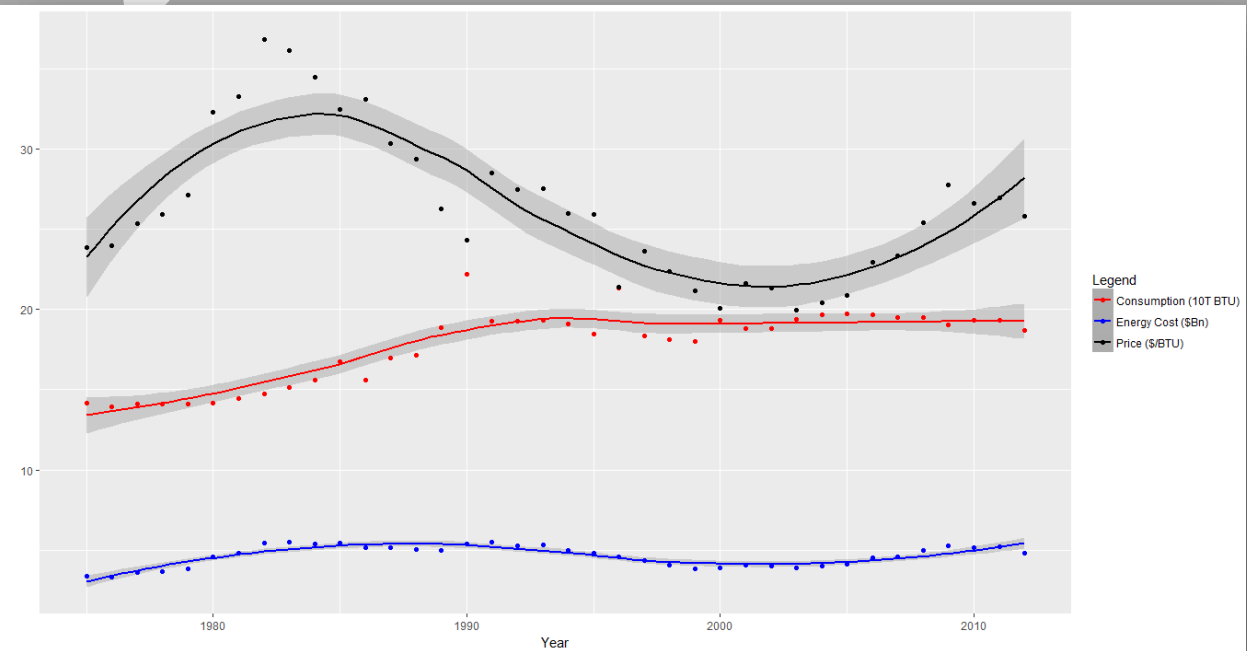


Historical Energy Usage in Trillion Site BTU

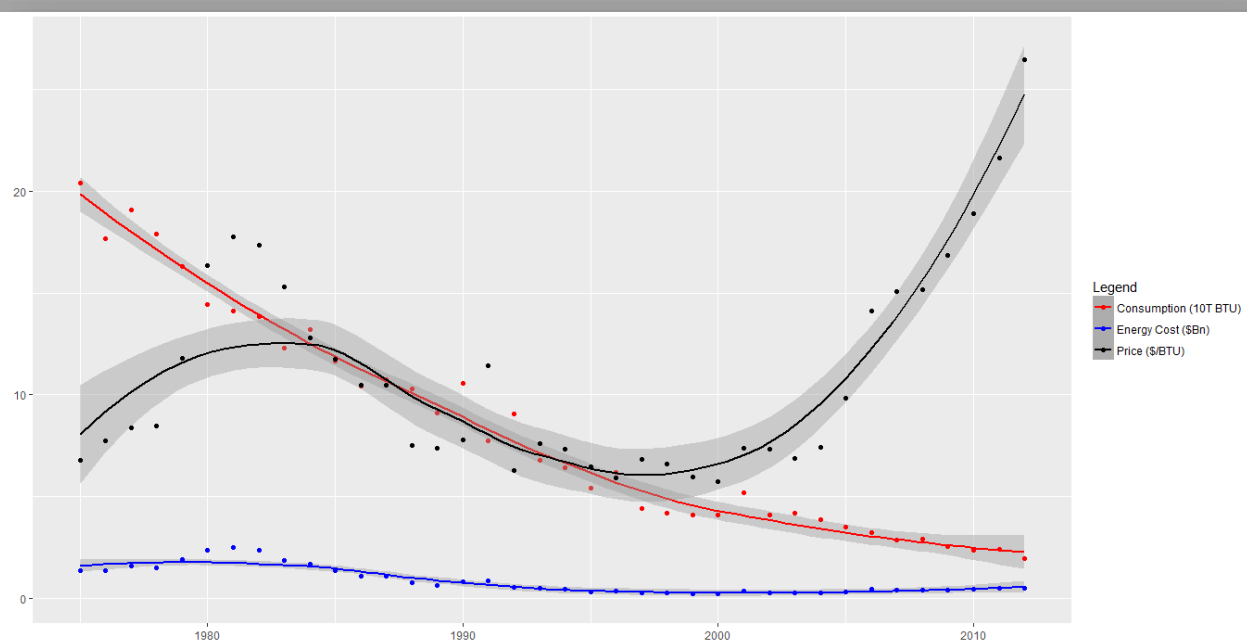
3 Energy Source Analysis

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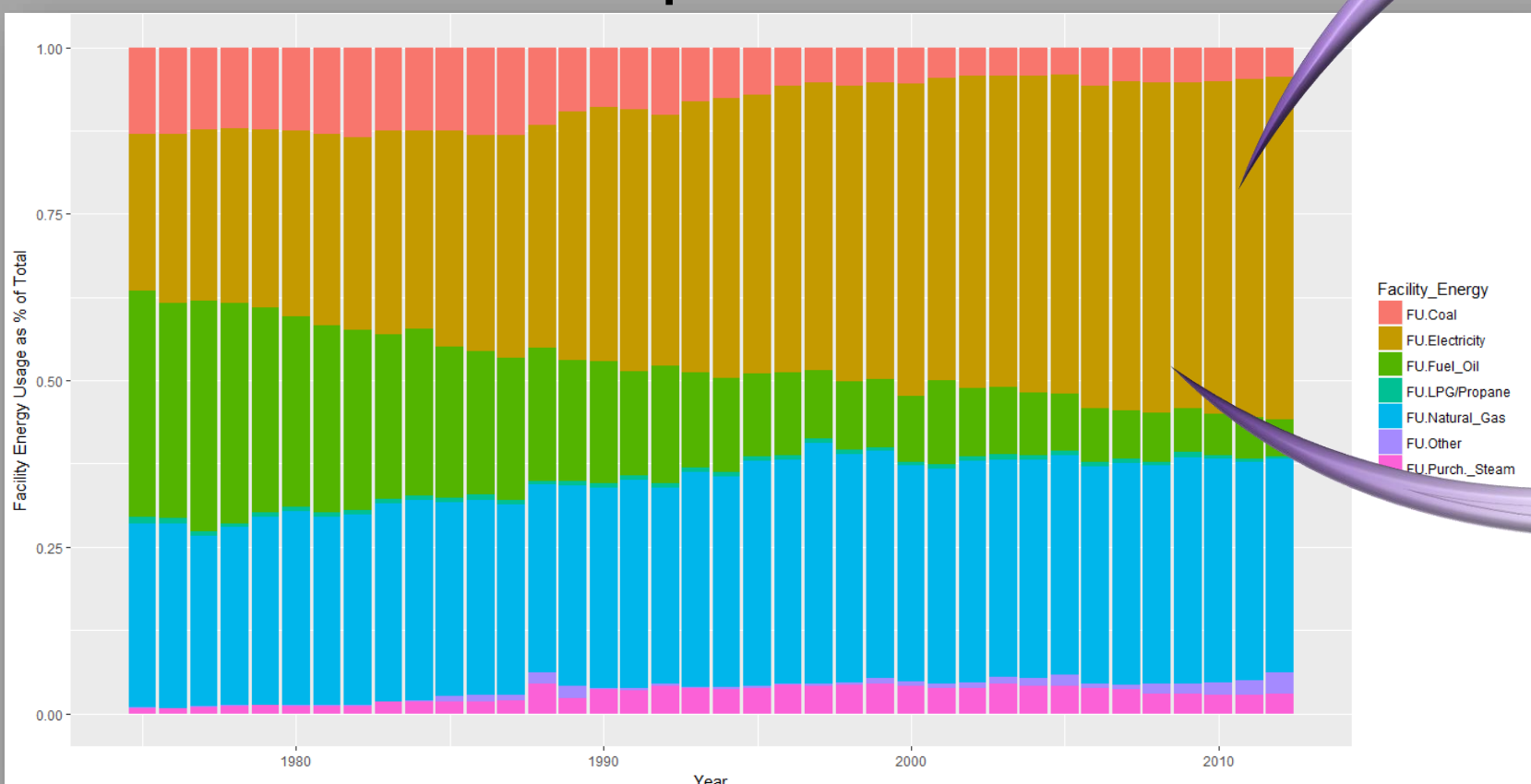
We can observe a high correlation between price of energy consumption cost and WTI crude oil price.



Consumption to Cost Analysis of Facility Electricity



Consumption to Cost Analysis of Facility Fuel Oil

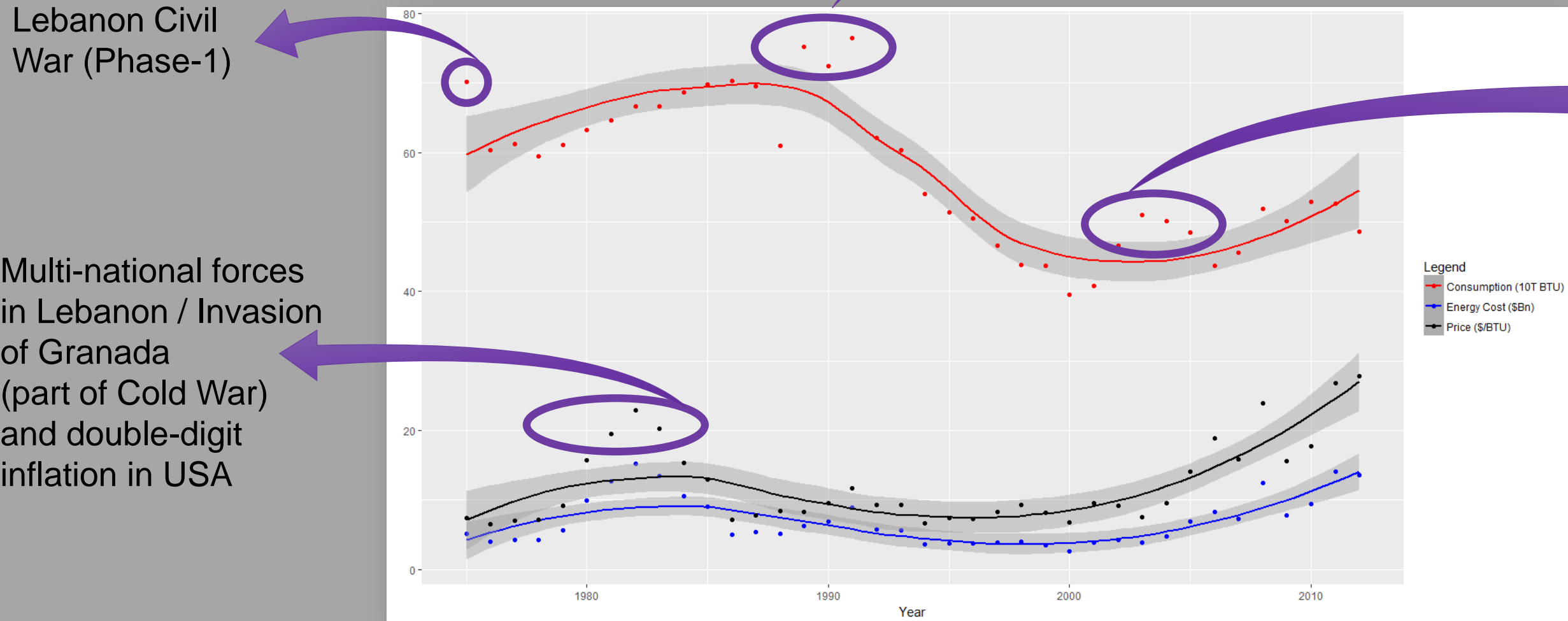


Historical Energy Composition' Structure

This trend clearly shows that consumption has remained constant with increase in per BTU cost.

Jet fuel is the largest Mobility Fuel consumed by DoD, corresponding to approx. 75% of total consumption. The above graph illustrates a historical trend of DOD's Jet Fuel consumption, cost & implied price. We can clearly identify years of high fuel consumption and corresponding global Invasions and wars.

DOD Jet Fuel Consumption / Cost Trend

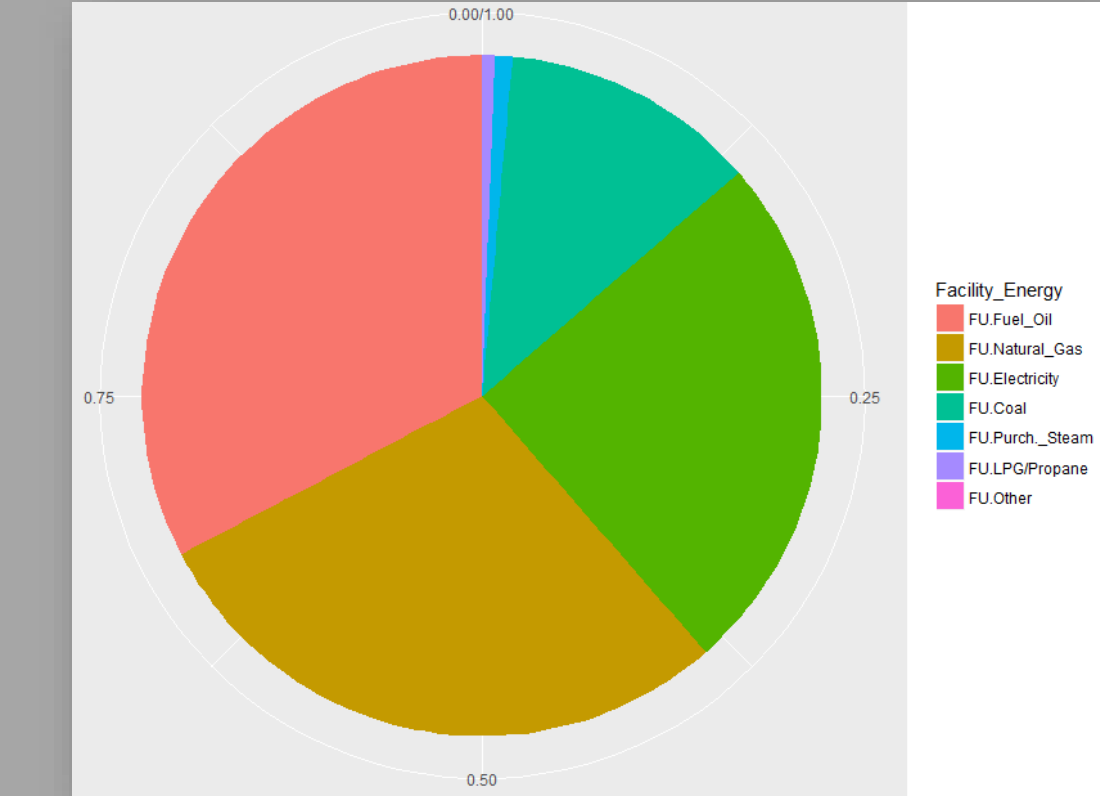


Lebanon Civil War (Phase-1)

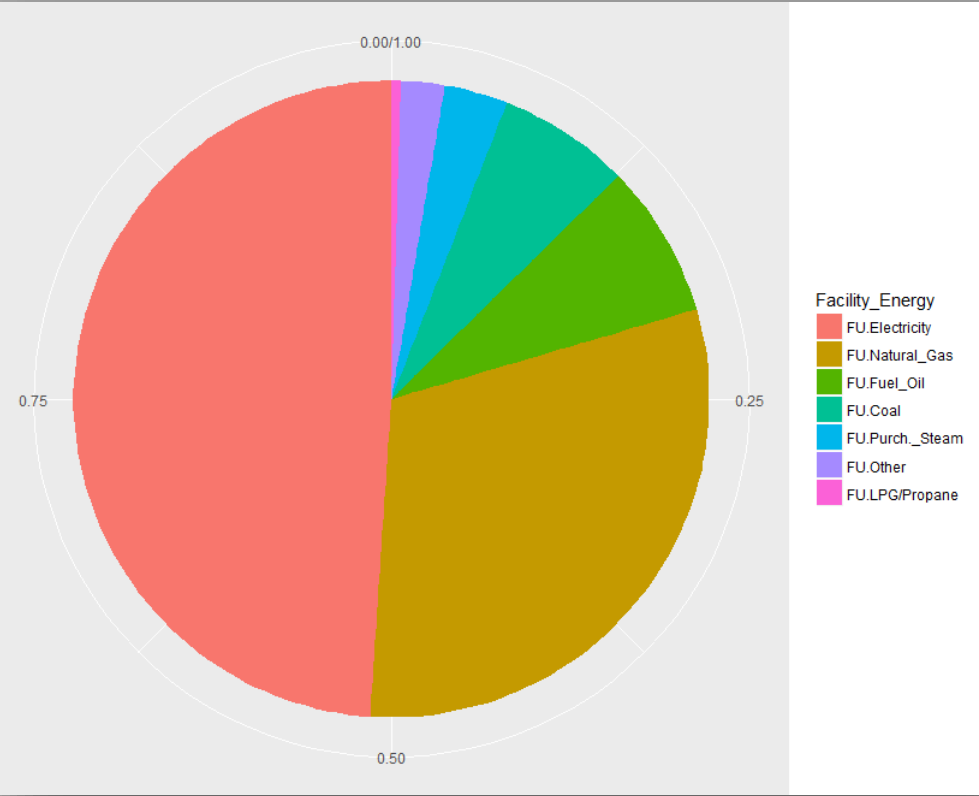
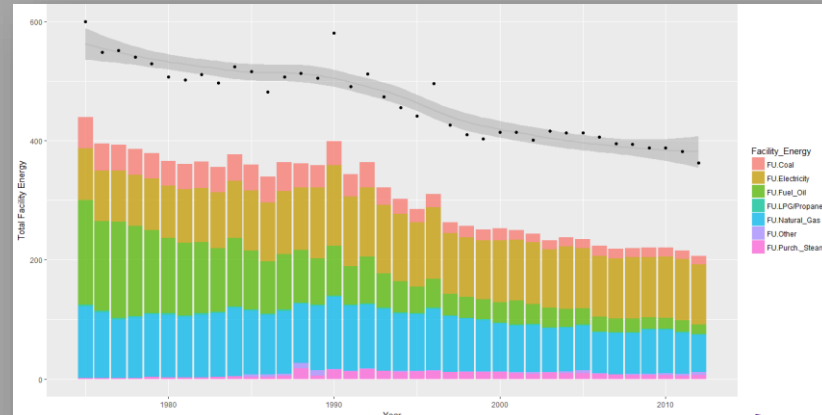
Multi-national forces in Lebanon / Invasion of Granada (part of Cold War) and double-digit inflation in USA

Gulf War – Iraqi withdrawal from Kuwait

War on Terror (Afghanistan / Iraq)



DOD Facility Energy Sources (1982)



DOD Facility Energy Sources (2012)