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ISDS 415

Tableau Project

Looking over the data I was given from the coffee chain, I was able to find a couple of issues that, if solved, should be able to increase the profitability of the coffee shops. The first issue I noticed is that some products are far less profitable than others. Most notably, green tea is not generating any profit whatsoever.

Product (CoffeeChain Query)	Profit	Total Expenses
Amaretto	5,163,840	9,395,232
Caffe Latte	13,377,000	12,288,024
Caffe Mocha	20,789,328	35,711,592
Chamomile	28,755,936	21,293,184
Columbian	58,929,024	33,129,888
Darjeeling	27,890,880	16,509,120
Decaf Espresso	34,694,352	22,247,568
Decaf Irish Cream	14,772,384	20,861,280
Earl Grey	23,197,440	16,239,360
Green Tea	-221,760	12,582,720
Lemon	31,541,664	29,299,776
Mint	6,498,624	10,458,624
Regular Espresso	11,836,440	5,725,944

Figure 1-1: Profit and Total Expenses for each product.

This table is showing each of the products that the coffee shops has to offer compared to their profit and the total expenses of each product. As you can see, many products are more profitable than others, for example, Columbian coffee is generating the most income for this coffee chain. There are a few products that are costing the company more than they are profiting, but the largest apparent issue is green tea. The green tea is generating the largest net loss for the company.
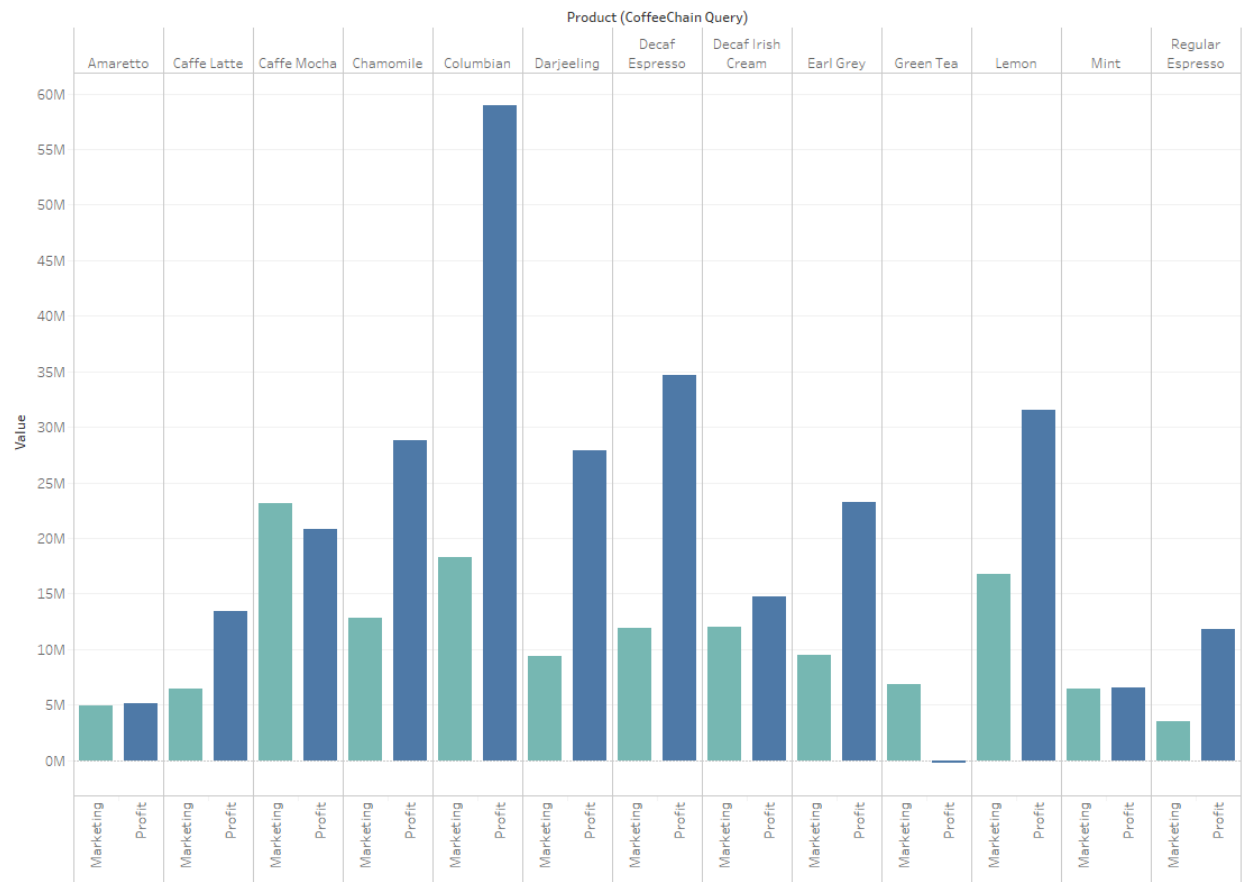
Figure 1-2: Marketing Expenditure and Profit for each product.

This graph shows each product, their individual profits, and the amount of money spent marketing each product. For most products, much more money is gained through profit than is spent on marketing. The exceptions being caffe mocha and green tea. Caffe mocha is still one of better selling products that the company has to offer, so the best option in this case would potentially be to drop the marketing value a bit on that particular product as they are not profiting as much as they are spending on marketing. As you can see in the graph, the marketing value for green tea is fairly low, however increasing marketing value will not likely improve the performance of the product. It is likely that dropping the product entirely may be the best course of action.

Figure 1-3: Green tea profit by state.

I decided to look state by state to find out in which states is green tea performing the worst. This is a map of the United States that shows performance of green tea sales in different states. As you can see, it is peforming reasonably well in some states including the ones in the eastern side of the US. However, it is performing incredibly poorly in Nevada, and it is also not profitable in Washington, Utah, and Missouri. With this information in mind, I believe the best course of action would be to remove green tea from the menu in these four states. This would be the best course of action in order to improve the profitability for green tea. The same process could be used to improve the profitability of the companies other products.

There is another issue that I came across while I was examining the data, that issue being the poor performance of individual states.
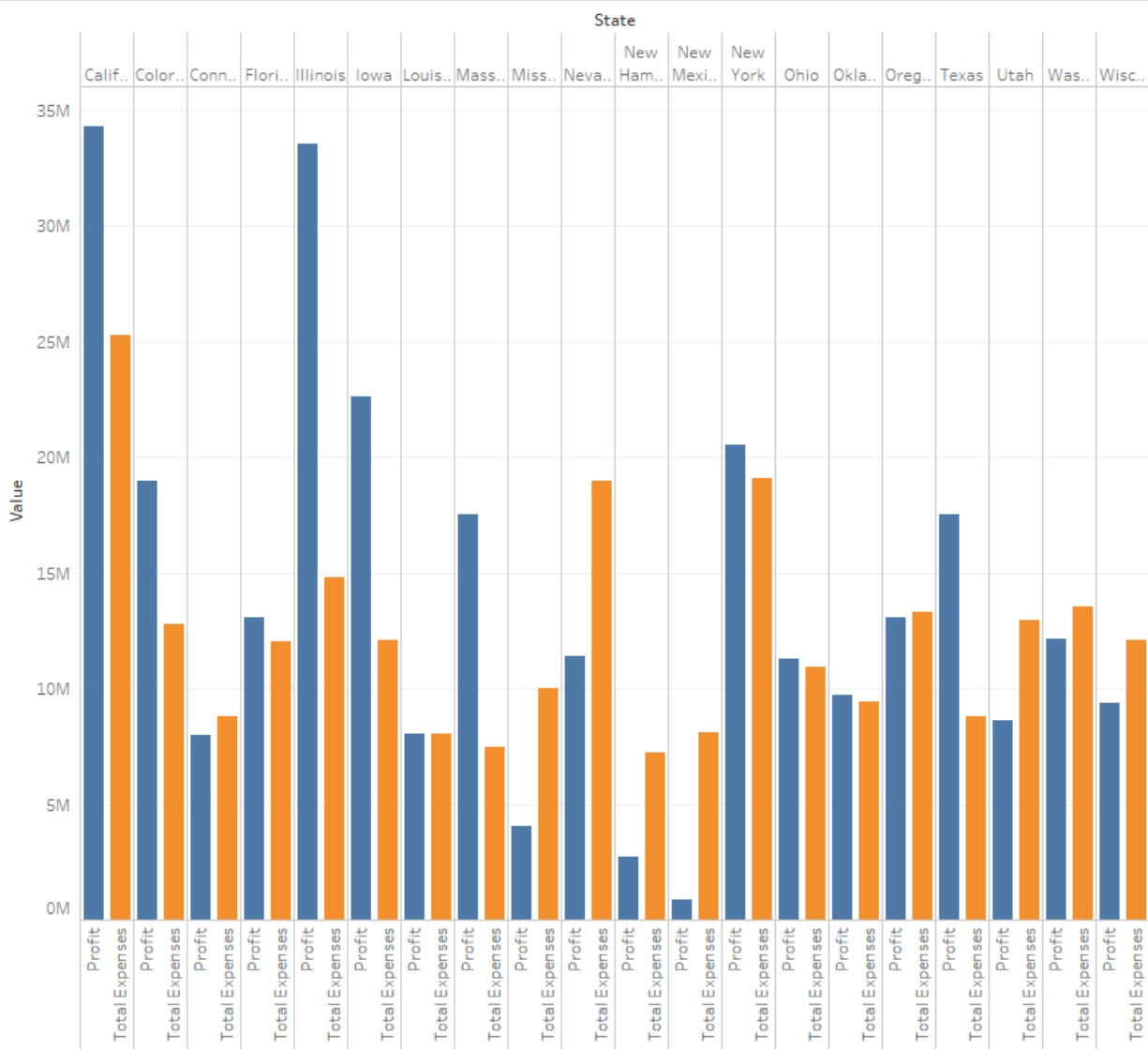

Figure 1-4: Profit and Total Expenses by state.

The graph above shows profit and total expenses of each state that the coffee chain is located in. The poorest performer is New Mexico, so that is the state that I chose to focus on in my research. We can see that the total expenses in New Mexico is higher than in a couple of other states including New Hampshire which is another poor performer. So I believe that the lack of profit is not caused by a lack of effort.
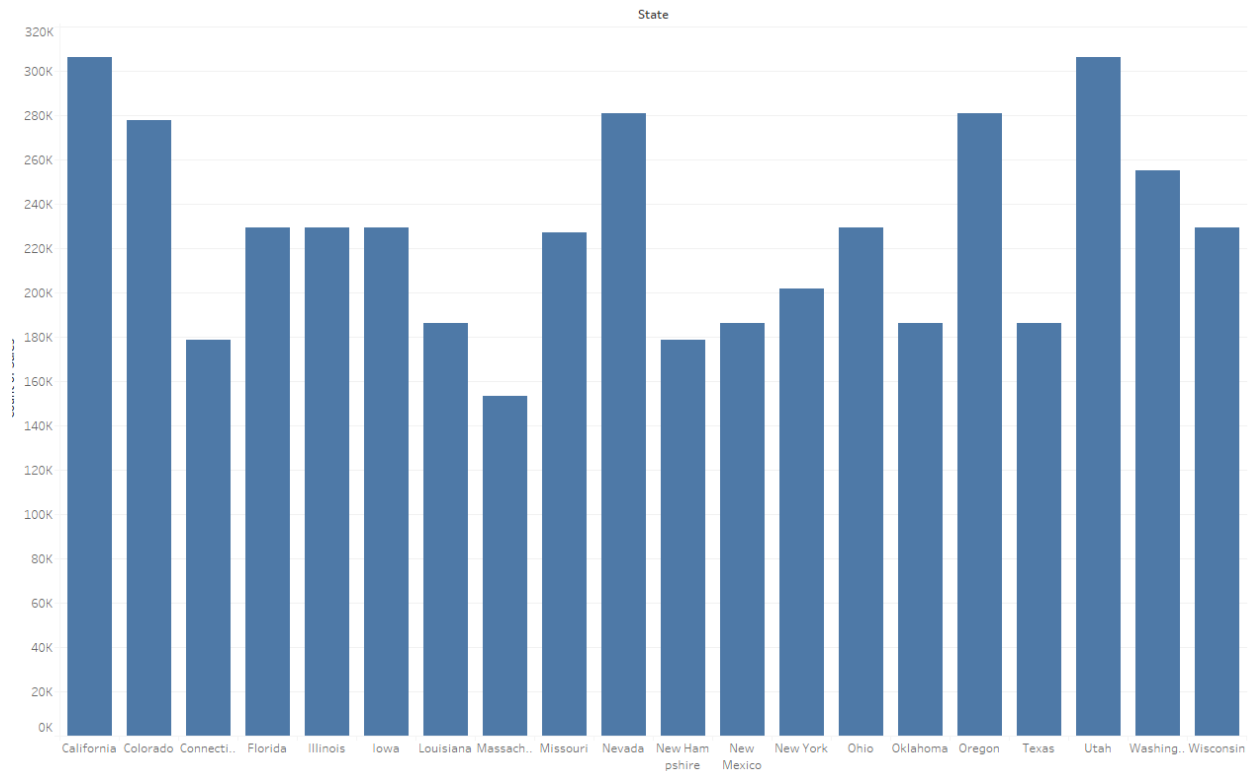
Figure 1-5: Total sales count by state.

This graph shows total count of sales for each state. This is notable because we can see that New Mexico is not the lowest performer in terms of total sales, despite it having the lowest profit of

Product (CoffeeChain Query)	California	Colorado	Connecticut	Florida	Illinois	Iowa	Louisiana	Massachuse..	Missouri	Nevada	New Hampshire	New Mexico	New York	Ohio	Oklahoma	Oregon	Texas	Utah	Washington	Wisconsin
Amaretto	-2,341,152	3,600,960				397,056				1,066,560				866,976		-143,616		1,192,224		524,832
Caffe Latte	5,288,472					0				1,026,648		-243,432			3,202,248	419,832	1,595,832	1,185,408	901,992	
Caffe Mocha	1,041,936	2,750,664	3,528	684,432	7,732,200	485,688	1,711,080	-349,272	1,440,600	439,824	-195,216	-188,160	-7,472,304	3,142,272	578,592	961,968	4,016,040	1,764,000	573,888	1,667,568
Chamomile	3,434,112	2,827,968		806,784	3,594,624	6,945,312	1,584,000		-177,408	935,616		397,056		521,664	521,664	746,592	853,248	1,066,560	3,166,944	1,531,200
Columbian	9,045,696	1,653,696	3,166,944	2,434,080	4,606,272	220,704	1,201,728	13,188,384	1,042,272	-47,520	948,288	953,568	9,044,640	872,256	1,345,344	418,176	5,757,312	717,024	1,752,960	607,200
Darjeeling	3,281,280	351,360	1,171,200	903,360	2,238,720	4,307,520		679,680	348,480	6,316,800	361,920		3,123,840	2,212,800		467,520		-148,800	1,395,840	879,360
Decaf Espresso	7,738,080	1,601,712	791,448	2,043,888	5,284,944	1,024,296	1,083,096		1,188,936	480,984		433,944		417,480	2,709,504	3,142,272	2,747,136	1,437,072	1,668,744	900,816
Decaf Irish Cream	-4,108,896	3,432,000		2,878,656	3,656,928	199,584	1,425,600		1,185,888	219,648		-721,248		-138,336	739,200	880,704	1,655,808	1,032,768	595,584	1,838,496
Earl Grey	2,240,640	792,960			1,313,280	5,399,040			-200,640	4,318,080				3,267,840	2,615,040	2,217,600		350,400	882,240	960
Green Tea	1,300,800	1,221,120	587,520	1,292,160			471,360		-43,200	-10,540,800	843,840			2,232,960		2,616,960		-198,720	-5,760	
Lemon	5,755,200	-148,896	1,043,328	524,832	1,656,864	3,660,096	1,046,496	386,496	-724,416	4,599,936	-43,296		212,256	746,592	602,976	1,339,008	876,480	956,736	1,204,896	1,412,928
Mint	1,642,080	860,640	1,189,056	1,490,016	3,436,224					3,650,592			-5,047,680					-722,304		
Regular Espresso								3,157,560			-245,784		8,924,664							

each of the states. This suggests that perhaps the issue is not the number of sales in the state.

Figure 1-6: Performance for each product by state.

This table, labelled Figure 1-6, shows performance of each product in each state. We can use this to pick out which items are underperforming in each state, we can see the green tea in Nevada example that we used before. If we look exclusively at New Mexico, we can see that none of the

products are performing particularly well, in fact some are generating a net loss for the state. I believe that this shows us that perhaps there is a product that is not being offered that could improve profits for the state if added, or perhaps the prices of some underperforming products could be adjusted to improve sales.

In addition to this coffee chain data, I decided to do some research on my own using Google Trends data. The topic that I chose was global warming and I wanted to look at the timeline of search results while also doing research on the interest spikes that I saw. Below I have attached a screenshot of the monthly trends on the topic according to Google Trends, Figure 2-1. The first spike is by far the largest I will be looking at and begins on approximately February 2007.
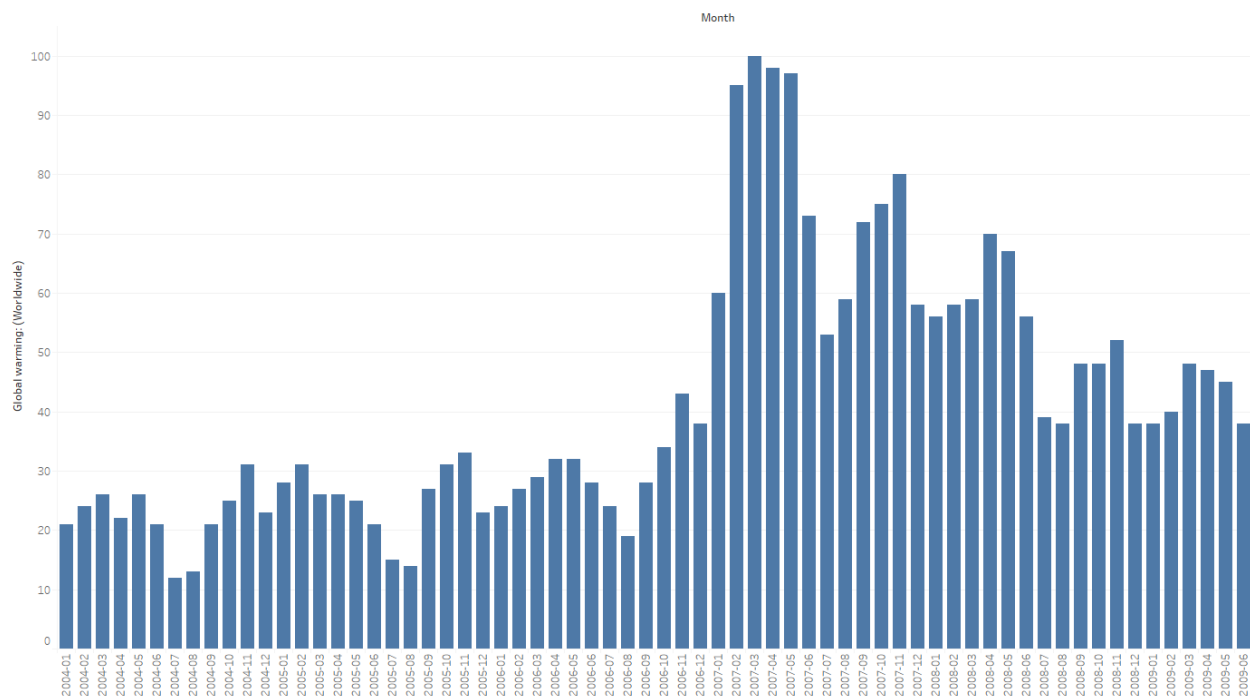
Figure 2-1: Google Trends results for Global Warming (Worldwide) for each month.

Looking further into this spike in popularity, I was able to find that on February 2nd, 2007 the Intergovernmental Panel on Climate Change stated with 90% certainty that human activities were to blame for global warming. The source stated that in 2007 the United States was responsible for approximately 25% of greenhouse gas emissions, so I decided that I would focus on the U.S. and how it reacted to global warming.
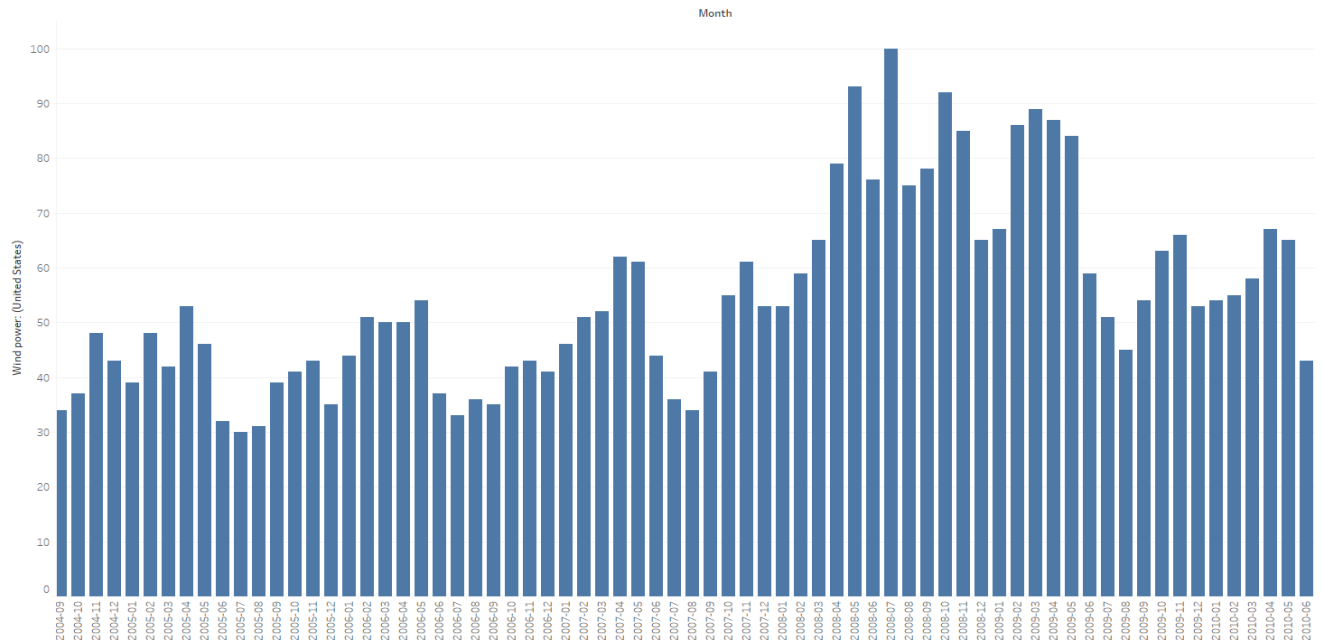
Figure 2-2: Google Trends results for Wind Power (United States) for each month.

This graph, Figure 2-2, is another Google Trends result for "wind power" in the United States. I decided to focus on the highest peak which was in July of 2008. I researched this period online and found a document published by the U.S. Department of Energy titled "20% Wind Energy by 2030". The United States has plenty of wide-open spaces that would be perfect for installing wind turbines, not just for reducing the country's carbon footprint, but also for reducing the country's dependence on foreign energy. It is also notable in this graph that there are smaller spikes in search trends before and after the July 2008 spike. This shows that wind power is a commonly-searched phrase in the United States and it is likely that interest in wind power did not stem directly from the global warming scare.
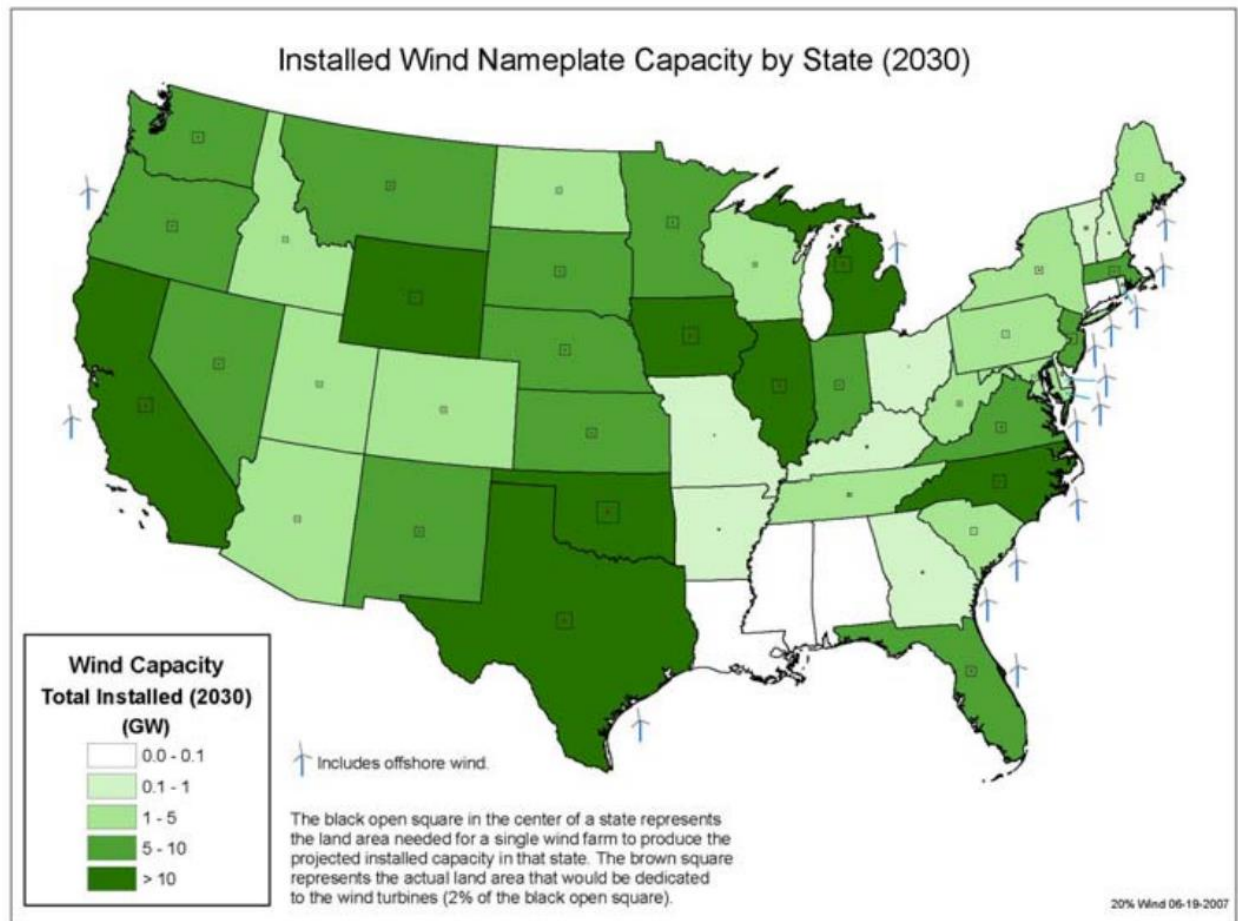
Figure 2-3: Proposed concentration of wind farms in the United States by 2030. (Credit U.S. Department of Energy report "20% Wind Energy by 2030").

This graphic came directly from the report published by the Department of Energy and can be found as Figure 1-8 in the report. This graphic shows the concentration of wind farms proposed to be developed in each state by 2030. As it states in the graphic, the black square represents the amount of land required to be dedicated to wind farms to reach the proposed amount of energy production in each state. This report shows that the U.S. is working towards not only a greener source of energy in wind power, but also a more independent source of energy.

Figure 2-4 on the next page shows a map of the United States detailing the states with the highest Google Trends interest in wind power during 2008. It is notable that some of the states on the map with high interest in wind power are states that are proposed to house a high concentration of wind farms according to the U.S. Department of Energy report. I did some research as to why

Vermont, the Dakotas, and Iowa are among the highest search interest and found that those four states, among others, have 10% or more of their electricity generated through wind power, with Iowa leading at 36.6% as of 2016.
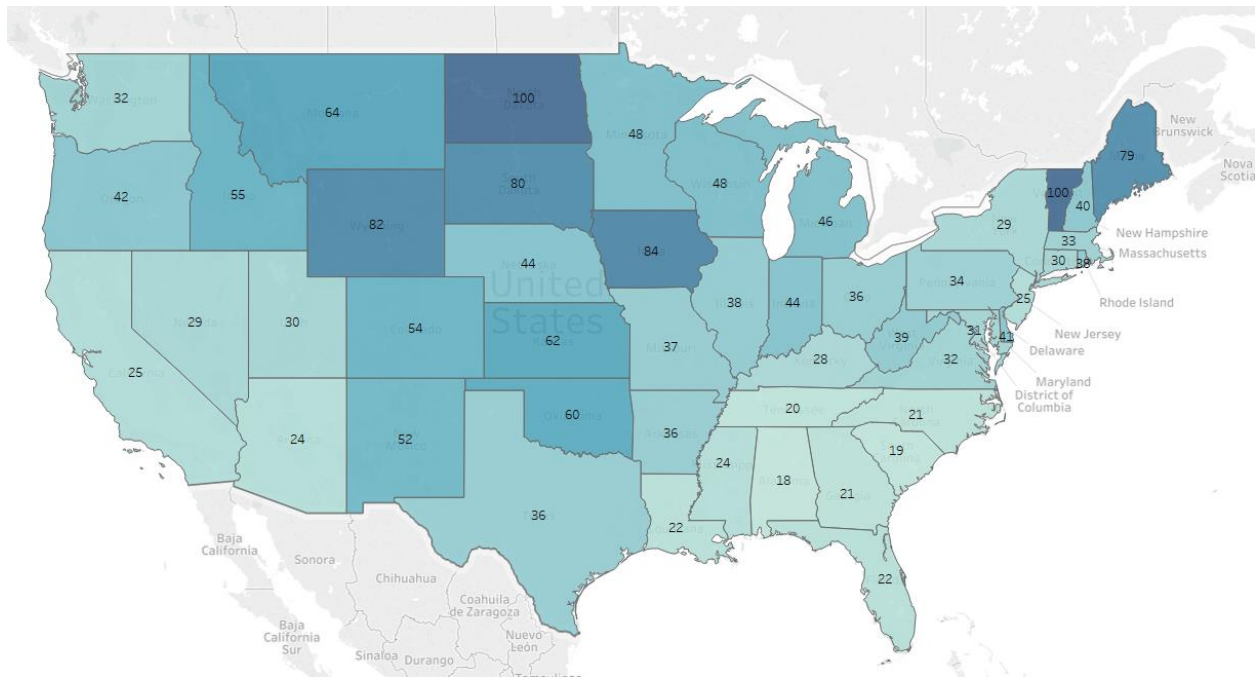

Figure 2-4: Map of the United States showing Google Trend interest in Wind Power in 2008.

The two largest contributors of carbon emissions as of 2019 are China and the United States, together contributing approximately 45% of the world's total emissions. To get a look at how the Chinese population sees global warming I did another Google Trends search on global warming specifically for China. The results are in Figure 2-5.
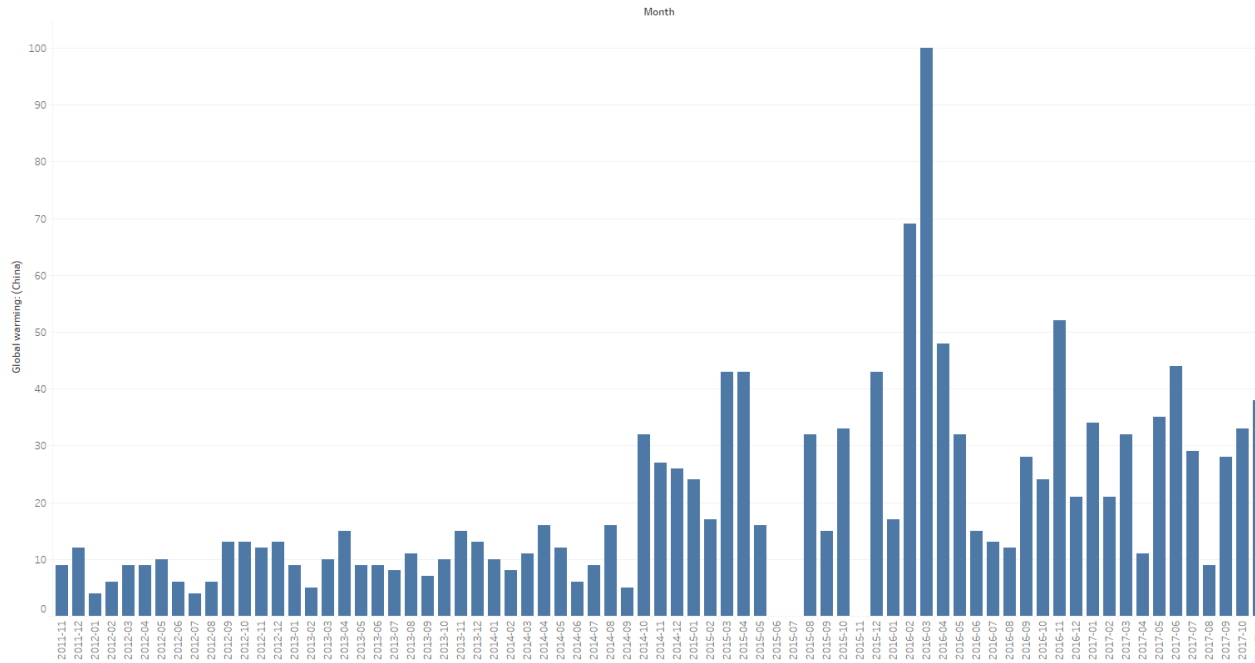
Figure 2-5: Google Trends results for Global Warming (China) for each month.

It is obviously apparent that there was initially very little search history for global warming in China up until March 2016 where there is a peak. Looking further into this peak, there was a warning made by Chinese official Zheng Guogang in which he stated that climate change could have a very significant impact on China including crop yields and average temperatures, which were already rising faster than the global average. Since then, China has stated that their goal is to peak their carbon emissions and get a fifth of its energy from non-fossil fuel sources by 2030.
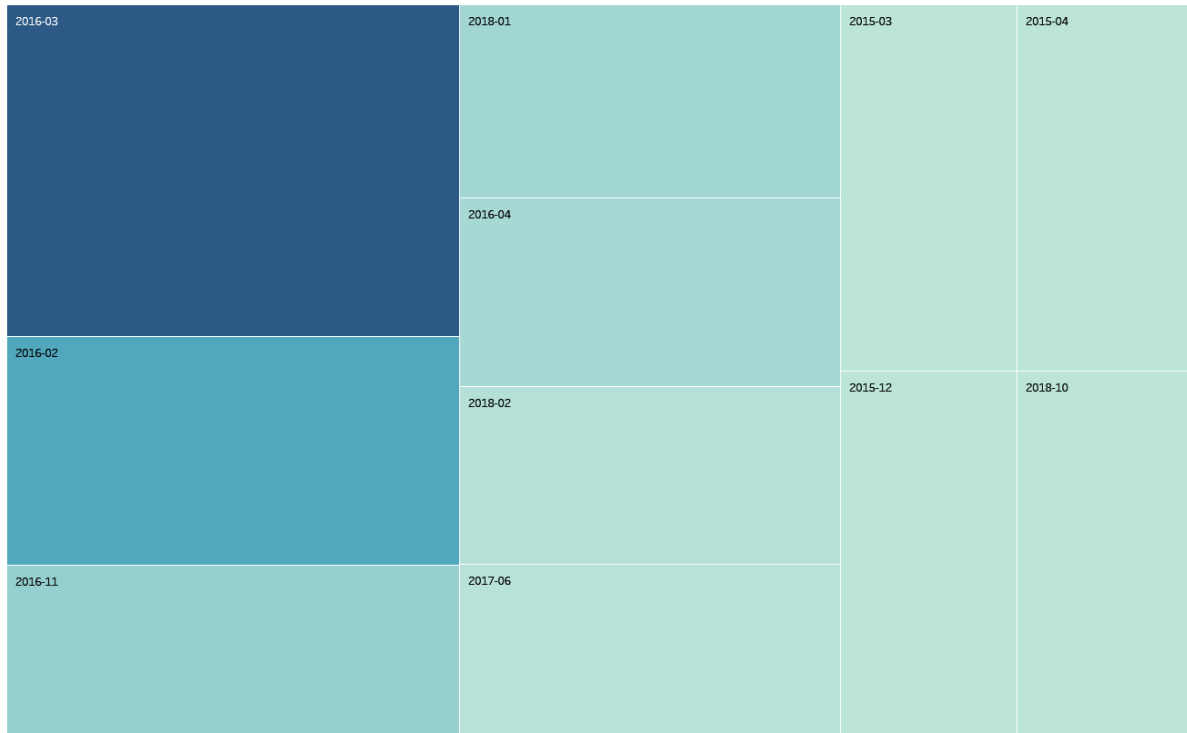
Figure 2-6: Google Trends results for Global Warming (China) for each month, showcasing the months with the most results.

Figure 2-6 shows 11 months with the most searches for global warming in China. I had already looked into March 2016, and the second and third months with the most searches are February 2016 and November 2016. For February 2016 I found an article that states that China had been under-reporting its coal consumption for years, by as much as 17% in 2012. However, it also stated that as of 2015, China's coal use fell by 3.7% from 2014 and 2.9% from the year prior. This showed that China was making efforts to cut fossil fuel consumption.

For November 2016, I found an article from the New York Times stating that Chinese President Xi Jinping would continue to fight climate change "whatever the circumstances". The article goes on to say that greenhouse gas emissions have leveled off over the last three years prior to 2016, but it is unknown if China has reached its emissions peak before the 2030 deadline.

I believe that the research that I have done here shows how useful of a tool Tableau and Google Trends can both be.